UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 9

IN THE MATTER OF: **Mariano Lake Mine Site** New Mexico Chevron U.S.A. Inc. Respondent	**ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR INTERIM REMOVAL ACTION** U.S. EPA Region 9 CERCLA Docket No. 2011-12 Proceeding Under Sections 104, 106(a), 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §§ 9604, 9606(a), 9607 and 9622

ADMINISTRATIVE ORDER ON CONSENT INTERIM REMOVAL ACTION FOR MARIANO LAKE MINE SITE

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Appendix A. Scope of Work

I. JURISDICTION AND GENERAL PROVISIONS

1. This Administrative Settlement Agreement and Order on Consent ("Settlement Agreement" or "AOC") is entered into voluntarily by the United States Environmental Protection Agency ("EPA") and Chevron U.S.A. Inc. ("Chevron" or "Respondent"). This Settlement Agreement provides for Respondent's performance of an Interim Removal Action as defined in Paragraph 10 and other actions as provided herein, as well as Respondent's reimbursement of certain response costs incurred by the United States at or in connection with the Mariano Lake Mine and areas to which the contamination from these areas has migrated (collectively, the "Site" or "Mariano Mine Site") located at 15N, 14W/Sections 11 and 12 in McKinley County, New Mexico. The Site and vicinity are shown on the map provided as Attachment 1 ("Map") to Appendix A, the Scope of Work ("SOW") to this AOC. The Site lies within Navajo tribal allotted and/or trust lands administered by the Bureau of Indian Affairs on behalf of the Eastern Agency of the Navajo Nation. Chevron is the corporate successor to the former Gulf Mineral Resources Company which previously held mining leases to the Mariano Lake Mine Site mining areas shown on these Maps.

2. This Settlement Agreement is issued under the authority vested in the President of the United States by Sections 104, 106(a), 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9604, 9606(a), 9607 and 9622, as amended ("CERCLA").

3. EPA has notified the Environment Department and the Mining and Minerals Division of the State of New Mexico (the "State") and the Navajo Nation of this action pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

4. EPA and Respondent recognize that Respondent has voluntarily offered to perform this action, that this Settlement Agreement has been negotiated in good faith and that the actions undertaken by Respondent in accordance with this Settlement Agreement do not constitute an admission of any liability. Respondent does not admit, and retains the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this Settlement Agreement, the validity of the findings of facts, conclusions of law, and determinations in Sections IV and V of this Settlement Agreement. Respondent agrees to comply with and be bound by the terms of this Settlement Agreement and, subject to the terms of this Settlement Agreement, agrees to perform all actions required by this Settlement Agreement and any modifications thereto, and further agrees that it will not contest the basis or validity of this Settlement Agreement or its terms.

5. Under this Settlement Agreement, Respondent will perform the Mariano Mine Site Interim Removal Action ("IRA") as provided herein and described in the attached Scope of Work ("SOW"), provided as Appendix A. The parties may then discuss the terms of another Settlement Agreement or an Amendment of this Settlement Agreement, which, if executed, may provide, *inter alia* for Respondent's execution of additional response actions on or near the Site, based, in part, upon the results of investigations performed pursuant to this Settlement Agreement, and for payment of additional response costs for the Site.

II. PARTIES BOUND

6. This Settlement Agreement applies to and is binding upon EPA and upon Respondent and its successors and assigns.

7. Any change in ownership or corporate status of Respondent including, but not limited to, any transfer of assets or real or personal property shall not alter Respondent's responsibilities under this Settlement Agreement.

8. Respondent shall ensure that its contractors, subcontractors, and representatives performing any portion of the Work as defined herein shall receive a copy of this Settlement Agreement and comply with this Settlement Agreement. Respondent shall be responsible for any noncompliance with this Settlement Agreement.

9. EPA intends to consult with and coordinate with the Navajo Nation throughout the performance of the Work and implementation of this Settlement Agreement, and to take Navajo Nation's comments and concerns into consideration. EPA's failure to do so, however, will not affect Respondent's rights or obligations under this Settlement Agreement.

III. DEFINITIONS

10. Unless otherwise expressly provided in this Settlement Agreement, terms used in this Settlement Agreement which are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Settlement Agreement or in the appendices attached hereto and incorporated hereunder, the following definitions shall apply:

a. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 9601, *et seq.*

b. "Day" shall mean a calendar day. In computing any period of time under this Settlement Agreement, where the last day would fall on a Saturday, Sunday, or Federal holiday, the period shall run until the close of business of the next working day.

c. "Effective Date" shall be the effective date of this Settlement Agreement as provided in Section XXX.

d. "EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

e. "Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs in reviewing or developing plans, reports and other items pursuant to this Settlement Agreement, verifying the Work, or otherwise implementing, overseeing, or enforcing this Settlement Agreement beginning on the day after the Effective Date of this AOC, including but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, the costs incurred to prepare decision documents, the costs incurred

pursuant to Section IX (Site Access), Section XIII (Emergency Response), and Paragraph 72 (Work Takeover). Future Response Costs shall also include all Interest, if Future Costs are not paid as required by this AOC.

f. "Interest" shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

g. "Interim Removal Action" or "IRA" shall mean the response actions required in this AOC and Appendix A, the SOW.

i. "IRA Area" shall mean the areas of the Site at which actions are required pursuant to this AOC and the SOW provided as Appendix A. These areas are also shown on the Map provided as Attachment 1 to the SOW.

j. "Mine Areas" shall mean the six areas described in the SOW and shown on the Map provided as Attachment 1 to the SOW.

k. "National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

l. "Navajo Nation EPA" or "NNEPA" shall mean the Navajo Nation Environmental Protection Agency and any successor departments or agencies of the Navajo Nation.

m. "Paragraph" shall mean a portion of this Settlement Agreement identified by an Arabic numeral.

n. "Parties" shall mean EPA and Respondent.

o. "Past Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States paid or incurred at or in connection with the Site, including any costs related to the hazardous substances at or originating from the Mariano Mine Site areas through the Effective Date of this AOC.

p. "RCRA" shall mean the Solid Waste Disposal Act, as amended, 42 U.S.C. §§ 6901, *et seq.* (also known as the Resource Conservation and Recovery Act).

q. "Respondent" shall mean Chevron U.S.A. Inc.

r. "Section" shall mean a portion of this Settlement Agreement identified by a Roman numeral.

s. "Settlement Agreement" shall mean this Administrative Settlement Agreement and Order on Consent and all appendices attached hereto, which are listed in Section XXIX (Severability, Integration and Appendices). In the event of conflict between this Settlement Agreement and any appendix, this Settlement Agreement shall control.

t. "Site" shall mean the Mariano Lake Mine Areas, including the areas depicted in Appendix A, the Scope of Work, Attachment 1, Figure 1 and located on Navajo Reservation lands within the Eastern Agency of the Navajo Nation. "Site" shall include other areas where hazardous substances associated with the Mariano Lake Mine Areas have been deposited, stored, disposed of, placed, or otherwise come to be located.

u. "State" shall mean the State of New Mexico.

v. "Waste Material" shall mean 1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); 2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); and 3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27).

w. "Work" shall mean all activities Respondent is required to perform under this Settlement Agreement.

x. "Working Day" shall mean a day other than a Saturday, Sunday or Federal holiday.

IV. FINDINGS OF FACT

EPA hereby finds the following facts, which Respondent neither admits nor denies:

11. The Site includes the former Mariano Lake Mine. From approximately 1977 to 1982, the former Gulf Mineral Resources Company, a wholly owned subsidiary of Gulf Oil Corporation operated the Mariano Mines pursuant to a mineral lease with the Bureau of Indian Affairs ("BIA"). Gulf Oil Corporation merged with Respondent in 1985. The reclamation obligations associated with the mineral lease were not extinguished by any relinquishment of that interest in the Mine Site area. The surface estate of the Mine Site area is owned by the United States in trust for the Navajo Nation.

12. The Site presents a risk of potential releases of hazardous substances to the air, surrounding soils, sediments, surface water, and ground water.

13. The Navajo Nation has asserted jurisdiction over the Site because the Site is on lands that were assigned to the Navajo Nation in the 1880s.

14. Under a 1991 Memorandum of Agreement between the Navajo Nation and EPA Regions 6, 8 and 9, EPA Region 9 has the lead on any EPA response action on lands within the Navajo Nation.

15. [Deleted.]

16. [Deleted.]

17. Land use in the area is mixed residential and grazing, and characterized by low-density residential homesites surrounded by open grazing land and pinyon-juniper forests. Residential homesites in the vicinity of the Mine Site area may have been impacted by releases of hazardous substances and contaminants transported by wind, historic dewatering of mining operations and runoff during snow, rain and flood events.

18. During July 2008, EPA conducted a preliminary gamma radiation activity assessment on portions of the Site. EPA's detection of elevated readings prompted EPA to perform assessment work within the Mine Site area and at residential homesites adjacent to the former mining areas. From approximately November 2009 through May 2010, EPA conducted gamma radiation surveys of nine homesites, and performed additional surface soil scans of the Mine Site area. EPA detected elevated readings of gamma radiation in areas of the Site and radium-226 in some of the surface soils. Radium is a "hazardous substance" as defined by section 101(14) of CERCLA.

19. This Settlement Agreement reserves and does not address investigation and cleanup of the mine site areas and groundwater, among other items, except to the extent provided in the SOW.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

20. Based on the Findings of Fact set forth above, EPA has determined that:

a. The Mariano Lake Mine Site is a "facility" as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

b. The contamination found at the Site, as identified in the Findings of Fact above, includes "hazardous substances" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

c. The Respondent is a "person" as defined by Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

d. The Respondent is a responsible party under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), and is liable for performance of response actions and for response costs incurred and to be incurred at the Site.

i. The Respondent's corporate predecessor Gulf Mineral Resources Company was an "owner" of the facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(1) of CERCLA, 42 U.S.C. § 9607(a)(1).

ii. The Respondent's corporate predecessor was an "operator" of the facility at the time of disposal of hazardous substances at the facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(2) of CERCLA, 42 U.S.C. § 9607(a)(2).

e. The conditions described in the Findings of Fact above constitute an actual or threatened "release" of a hazardous substance from the facility as defined by Section 101(22) of CERCLA, 42 U.S.C.§ 9601(22).

f. The Interim Removal Action required by this Settlement Agreement is necessary to protect the public health, welfare, or the environment and, if carried out in compliance with the terms of this Settlement Agreement, will be considered consistent with the NCP, as provided in Section 300.700(c)(3)(ii) of the NCP.

g. The Interim Removal Action required by this Settlement Agreement meets the criteria for a removal action under Section 300.415(b) of the NCP.

VI. SETTLEMENT AGREEMENT AND ORDER

21. Based upon the foregoing Findings of Fact, Conclusions of Law, and Determinations, it is hereby Ordered and Agreed that Respondent shall comply with all provisions of this Settlement Agreement, including, but not limited to, all attachments to this Settlement Agreement and all documents incorporated by reference into this Settlement Agreement.

VII. DESIGNATION OF CONTRACTOR, PROJECT COORDINATOR, AND ON-SCENE COORDINATOR

22. Respondent shall retain one or more contractors to perform the Work and shall notify EPA of the name(s) and qualifications of such contractor(s) within fourteen (14) days of the Effective Date. Respondent shall also notify EPA of the name(s) and qualification(s) of any other contractor(s) or subcontractor(s) retained to perform the Work at least seven (7) days prior to commencement of such Work. EPA retains the right to disapprove of any or all of the contractors and/or subcontractors retained by Respondent. If EPA disapproves of a selected contractor, Respondent shall retain a different contractor and shall notify EPA of that contractor's name and qualifications within thirty (30) days of EPA's disapproval. The proposed contractor(s) must demonstrate compliance with ANSI/ASQC E-4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995), by submitting a copy of the proposed contractor's Quality Management Plan ("QMP"). The QMP should be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B0-1/002), or equivalent documentation as required by EPA.

23. Respondent has designated a Project Coordinator for this Project:

Mariano Lake Mine Project Coordinator:
Name: Satya Sinha, Project Manager
Address: Chevron Environmental Management Corporation
Superfund and Specialty Portfolios
Chevron Engineering Management Company
6101 Bollinger Canyon Road
San Ramon, CA 94583
Telephone: (925) 790-6432
Facsimile: (925) 790-6772
Email: satyasinha@chevron.com

To the greatest extent possible, the Project Coordinator shall be present on Site or readily available during Site work. EPA retains the right to disapprove of the designated Project Coordinator. If EPA disapproves of the designated Project Coordinator, Respondent shall retain a different Project Coordinator and shall notify EPA of that person's name, address, telephone number, and qualifications within fifteen (15) days following EPA's disapproval. Receipt by Respondent's Project Coordinator of any notice or communication from EPA relating to this Settlement Agreement shall constitute receipt by the Respondent.

24. EPA has designated Andrew Bain, Remedial Project Manager in the Region 9 Superfund Division, and Donn Zuroski, On-Scene Coordinator in the Region 9 Superfund Division, as its On-Scene Coordinators ("OSCs"). Except as otherwise provided in this Settlement Agreement, Respondent shall direct all submissions required by this Settlement Agreement to both OSCs and to the Navajo Nation, by U.S. Mail, overnight mail, facsimile, or email, to the following representatives:

Andrew Bain
U.S. EPA, Mail Code SFD-6-2
75 Hawthorne St.
San Francisco, CA 94105
Telephone: 415-972-3167
Facsimile: 415-947-3528
Email: Bain.Andrew@epa.gov

and

Donn Zuroski (Alternate OSC)
U.S. EPA, Mail Code SFD-9-2
75 Hawthorne St.
San Francisco, CA 94105
Telephone: 415-972-3035
Facsimile: 415-947-3518
Email: Zuroski.Donn@epa.gov

and

David A. Taylor
Navajo Nation Department of Justice
P.O. Drawer 2010
Window Rock, AZ 86515
Telephone 928-871-6347
Fax 928-871-6200
Email dtaylor@nndoj.org

and

Michele Dineyazhe
Navajo Nation Environmental Protection Agency
P.O. Box 2946
Window Rock, AZ 86515
Telephone: (928) 871-7820
Facsimile: (928) 871-7333
Email: dineyazhe.michele@epa.gov
Overnight Mail to: Hwy 264 43 Crest Rd Saint Michaels, AZ 86511

Two hard copies, one electronic copy transmitted by email and one electronic copy on a CD or DVD of all proposed Work Plans and Work Plan submittals shall be provided to Andrew Bain and also to Michele Dineyazhe, at the addresses shown above. Email notification that these documents have been shipped shall also be provided to all of the listed representatives.

25. EPA and Respondent shall have the right, subject to the requirements of this Section, to change their respective designated OSC(s) or Project Coordinator. Respondent shall notify EPA fifteen (15) days before such a change is made. The initial notification may be made orally, but shall be promptly followed by a written notice. The Navajo Nation may change its representatives by written notice to EPA and Respondent.

VIII. WORK TO BE PERFORMED

Respondent shall perform, at a minimum, all actions necessary to implement the Mariano Interim Removal Action, as described in and required by the attached SOW, Appendix A. The actions to be implemented generally include, but are not limited to, the following: scanning, sampling and analysis, fencing, chip seal or paving of roads and other soil stabilization activities, including addition of soil tackifier.

All Work will be conducted in compliance with all regulatory requirements, as well as in accordance with the Health and Safety Plan developed pursuant to this Settlement Agreement. All Work must be designed to last at least five years, including maintenance over that period, in accordance with the schedule provided in the SOW.

26. Work Plan Approval. Respondent will submit to EPA Work Plans in accordance with the SOW provided as Appendix A, for EPA approval, approval with modifications or disapproval, in accordance with the schedule provided in the SOW.

27. Submittals, Approvals and Implementation. EPA, after consultation with NNEPA, will approve, approve with modifications or disapprove the Work Plan, and may approve, disapprove, require revisions to, or modify, in whole or in part, all documents submitted under this Settlement Agreement (collectively, "Submittals"), provided such revisions or modifications do not materially expand the SOW. EPA has agreed to try to provide its review of, and responses to, Submittals within two weeks; provided that EPA's lack of response within this time frame does not constitute approval of any Submittal. This two-week period shall begin on the date that the hard copy of each submittal, including the Work Plans, has been received by both EPA and Navajo Nation EPA. Respondent may request a shorter review and response from EPA for any particular Submittal, and EPA agrees to consider such requests. If EPA requires revisions, Respondent shall submit a revised Submittal within 10 Working Days of receipt of EPA's notification of the required revisions. However, EPA may require the implementation of a Work Plan that is approved with modifications without waiting for Respondent to submit a revised version of the Submittal. Respondent shall implement the Submittal as approved in writing by EPA in accordance with the schedule approved by EPA. Once approved, or approved with modifications, the Submittal as approved or approved with modifications, the Schedule, and any subsequent modifications shall be deemed incorporated into and become fully enforceable under this Settlement Agreement. All Work under this Settlement Agreement and/or the Mariano Interim Removal Work Plans shall be conducted in accordance with the provisions of this Order, CERCLA, the NCP and relevant EPA guidance. Respondent shall not commence any Work, except in conformance with the terms of this Settlement Agreement. Respondent shall not commence implementation of any Work Plan developed hereunder until receiving EPA approval.

28. Health and Safety Plan. In accordance with the SOW, Respondent shall submit for EPA review and comment a plan that ensures the protection of the public health and safety during performance of on-Site work under this Settlement Agreement. This plan shall be prepared in accordance with EPA's Standard Operating Safety Guide (PUB 9285.1-03, PB 92-963414, June 1992). In addition, the plan shall comply with all currently applicable Occupational Safety and Health Administration ("OSHA") regulations found at 29 C.F.R. Part 1910. If EPA determines that it is appropriate, the plan shall also include contingency planning. Respondent shall incorporate all changes to the plan recommended by EPA and shall implement the plan during the pendency of the removal action.

29. Quality Assurance and Sampling.

a. All sampling and analyses performed pursuant to this Settlement Agreement shall conform to EPA direction, approval, and guidance, after consultation with NNEPA, regarding sampling, quality assurance/quality control ("QA/QC"), laboratory data validation, and chain of custody procedures. Respondent shall ensure that the laboratory used to perform the analyses participates in a QA/QC program that complies with the appropriate EPA guidance. Respondent shall follow, as appropriate, "Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures" (OSWER Directive No. 9360.4-01, April 1, 1990), as guidance for QA/QC and sampling. Respondent shall only use laboratories that have a documented Quality System that complies with ANSI/ASQC E-4 1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and

Environmental Technology Programs" (American National Standard, January 5, 1995), and "EPA Requirements for Quality Management Plans (QA/R-2) (EPA/240/B-01/002, March 2001)," or equivalent documentation as determined by EPA. EPA may consider laboratories accredited under the National Environmental Laboratory Accreditation Program ("NELAP") as meeting the Quality System requirements.

b. Upon request by EPA, Respondent shall have such a laboratory analyze samples submitted by EPA for QA monitoring. Respondent shall provide to EPA the QA/QC procedures followed by all sampling teams and laboratories performing data collection and/or analysis.

c. Upon request by EPA and/or the NNEPA, Respondent shall allow EPA and/or the NNEPA, or their authorized representatives, to take split and/or duplicate samples. Respondent shall notify EPA not less than fourteen (14) days in advance of any sample collection activity, unless shorter notice is agreed to by EPA. EPA shall have the right to take any additional samples that EPA deems necessary. Upon request, EPA shall allow Respondent to take split or duplicate samples of any samples it takes as part of its oversight of Respondent's implementation of the Work.

d. Respondent shall submit laboratory-validated data to EPA electronically (MS Office compatible) within five days of its receipt by Respondent or Respondent's contractor.

30. All Interim Removal Action Work shall be completed within the times specified in the SOW, unless delayed by a Force Majeure or agreement with EPA. In accordance with the Work Plan schedule, or as otherwise directed by EPA, Respondent shall submit a proposal for post-removal site control consistent with Section 300.415(l) of the NCP and OSWER Directive No. 9360.2-02. Upon EPA approval, Respondent shall implement such controls and shall provide EPA with documentation of all post-removal site control arrangements.

31. Reporting.

Unless otherwise directed in writing by the OSC, Respondent shall submit a written progress report to EPA and NNEPA concerning actions undertaken pursuant to this Settlement Agreement, every month after the Effective Date of this Settlement Agreement until termination of this Settlement Agreement. These reports shall describe all significant developments during the preceding period, including the actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period, including a schedule of actions to be performed, anticipated problems, and planned resolutions of past or anticipated problems.

a. Respondent shall submit three (3) copies of all plans, reports or other submissions required by this Settlement Agreement or any approved work plan, with two copies to be sent to US EPA and one copy to be sent to NNEPA. In addition, Respondent shall submit such documents in electronic form including one copy by email and one copy on a CD or DVD to US EPA and one copy to NNEPA.

b. If Respondent owns or controls any real property at the Site, Respondent agrees to require that any successors comply with Sections IX (Site Access) and X (Access to Information).

32. Final Completion Report. In accordance with the Schedule in the Scope of Work, Respondent shall submit for EPA review and approval, after consultation with NNEPA, a final Completion Report (the Mariano Interim Removal Action Completion Report) summarizing the actions taken to comply with this Settlement Agreement. This final Completion Report shall conform, to the extent applicable, with the requirements set forth in Section 300.165 of the NCP entitled "OSC Reports", and with "Superfund Removal Procedures: Removal Response Reporting – POLREPS and OSC Reports" (OSWER Directive No. 9360.3-03, June 1, 1994). The final report shall include a good faith estimate of total costs or a statement of actual costs incurred in complying with the Settlement Agreement, a listing of quantities and types of any materials removed off-Site or handled on-Site, a discussion of removal and disposal options considered for those materials, a listing of the ultimate destination(s) of those materials, a presentation of the analytical results of all sampling and analyses performed, and all manifests and permits generated during the removal action. The final Completion Report shall also include the following certification signed by a person who supervised or directed the preparation of that report:

"Under penalty of law, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of the report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

33. Off-Site Shipments

a. Respondent shall, prior to any off-Site shipment of Waste Material from the Site to an out-of-state waste management facility, provide written notification of such shipment of Waste Material to the appropriate state environmental official in the receiving facility's state and to the On-Scene Coordinator. However, this notification requirement shall not apply to any off-Site shipments when the total volume of all such shipments will not exceed 10 cubic yards.

i. Respondent shall include in the written notification the following information: 1) the name and location of the facility to which the Waste Material is to be shipped; 2) the type and quantity of the Waste Material to be shipped; 3) the expected schedule for the shipment of the Waste Material; and 4) the method of transportation. Respondent shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the Waste Material to another facility within the same state, or to a facility in another state.

ii. The identity of the receiving facility and state will be determined by Respondent following the award of the contract for the removal action. Respondent shall provide the information required by subparagraph a. and b. of this paragraph, as soon as practicable after the award of the contract and before the Waste Material is actually shipped.

b. Before shipping any hazardous substances, pollutants, or contaminants from the Site to an off-site location, Respondent shall obtain EPA's certification that the proposed receiving facility is operating in compliance with the requirements of CERCLA Section 121(d)(3), 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondent shall only send hazardous substances, pollutants, or contaminants from the Site to an off-site facility that complies with the requirements of the statutory provision and regulation cited in the preceding sentence. Off-site transfers of laboratory samples and wastes pursuant to 40 C.F.R. § 300.440(a)(5) are not subject to the requirements of this subparagraph.

IX. SITE ACCESS

34. If the Site, or any other property where access is needed to implement this Settlement Agreement, is owned or controlled by Respondent, Respondent shall, commencing on the Effective Date: (1) provide EPA and its representatives, including contractors, with access at all reasonable times to the Site, or such other property, for the purpose of conducting any activity related to this Settlement Agreement, and (2) provide the NNEPA and its designated representatives, including technical contractors, with access at all reasonable times to the Site, or such other property, for the purpose of overseeing, observing, monitoring, and taking split samples, during any EPA activities related to this Settlement Agreement.

35. If access to any residences and/or residential yards in the vicinity of the Site is required, Respondent shall consult with EPA and NNEPA on a coordinated access approach, which will include EPA and NNEPA making the initial effort to obtain necessary access agreements. Where any action under this Settlement Agreement is to be performed in areas owned by or in possession of someone other than Respondent, Respondent shall use their best efforts to obtain all necessary access agreements within fifteen (15) days after the Effective Date, or as otherwise specified in writing by the OSC. Respondent shall immediately notify EPA and the Navajo Nation if, after using their best efforts, Respondent is unable to obtain such agreements. For purposes of this Paragraph, "best efforts" includes the payment of reasonable sums of money in consideration of access. Respondent shall describe in writing Respondent's efforts to obtain access. EPA may then assist Respondent in gaining access, to the extent necessary to effectuate the response actions described herein, using such means as EPA deems appropriate. Respondent shall reimburse EPA for all costs and attorney's fees incurred by the United States in obtaining such access, in accordance with the procedures in Section XV (Payment of Response Costs). NNEPA has agreed to provide the Navajo Nation's authorization to access Navajo lands in the form of an appropriately executed authorization letter.

36. Commencing on the Effective Date of this Settlement Agreement, Respondent shall refrain from using the IRA Area in any manner that would interfere with or adversely affect the implementation, integrity, or protectiveness of the response measures to be implemented pursuant to this Settlement Agreement. Such restricted or prohibited activities in the IRA Area include, but are not limited to, disturbance of any soils in any manner in such areas that might cause a release of wastes, except as provided for under this Settlement Agreement or any other Orders under CERCLA EPA has issued to or entered into with Respondent with respect to the Site. Should Respondent be required to take any action under a storm water permit that

Respondent believes may conflict with this Paragraph, Respondent shall consult with EPA prior to taking such action, and shall work with EPA, after consultation with NNEPA, to minimize soil disturbance or other adverse consequences of such action.

37. Notwithstanding any provision of this Settlement Agreement, EPA retains all of its access authorities and rights, as well as all of its rights to require land/water use restrictions, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

X. ACCESS TO INFORMATION

38. Respondent shall provide to EPA, upon request, copies of all documents and information within their possession or control or that of their contractors or agents relating to activities at the Site or to the implementation of this Settlement Agreement, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Respondent shall also make reasonably available to EPA, for purposes of investigation or information gathering, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

39. Respondent may assert business confidentiality claims covering part or all of the documents or information submitted to EPA under this Settlement Agreement to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Documents or information determined to be confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when they are submitted to EPA, or if EPA has notified Respondent that the documents or information are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public and the Navajo Nation may be given access to such documents or information without further notice to Respondent, as provided in 40 C.F.R. Part 2 Subpart B.

40. Respondent may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Respondent asserts such a privilege in lieu of providing documents, it shall provide EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the contents of the document, record, or information; and 6) the privilege asserted by Respondent. However, no documents, reports or other information required to be submitted under this Settlement Agreement shall be withheld on the grounds that they are privileged.

41. No claim of confidentiality shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Site generated on or after January 1, 2005.

XI. RECORD RETENTION

42. Until 7 years after Respondent's receipt of EPA's notification pursuant to Section XXVIII (Notice of Completion of Work), Respondent shall preserve and retain all non-identical copies of records and documents (including records or documents in electronic form) now in their possession or control or which come into their possession or control that relate in any manner to the performance of the Work or the liability of any person under CERCLA with respect to the Site, regardless of any corporate retention policy to the contrary. Until 7 years after Respondent's receipt of EPA's notification pursuant to Section XXVIII (Notice of Completion of Work), Respondent shall also instruct their contractors and agents to preserve all documents, records, and information of whatever kind, nature or description relating to performance of the Work.

43. At the conclusion of this document retention period, Respondent shall notify EPA and the Navajo Nation at least 90 days prior to the destruction of any such records or documents, and, upon request by EPA or the Navajo Nation, Respondent shall deliver any such records or documents to EPA or the Navajo Nation. Respondent may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Respondent asserts such a privilege, it shall provide EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the subject of the document, record, or information; and 6) the privilege asserted by Respondent. However, no final documents, reports or other information created or generated under this Settlement Agreement shall be withheld on the grounds that they are privileged.

44. Respondent hereby certifies that, since notification by US EPA of Respondent's potential liability, to the best of its knowledge and belief, after thorough inquiry, Respondent has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, documents or other information (other than identical copies) relating to its potential liability regarding the Site and that it has fully complied with any and all EPA requests for information regarding the Site pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927.

XII. COMPLIANCE WITH OTHER LAWS

45. Respondent shall perform all actions required pursuant to this Settlement Agreement in accordance with all applicable local, state, tribal, and federal laws and regulations except as provided in Section 121(e) of CERCLA, 42 U.S.C. § 6921(e), and 40 C.F.R. §§ 300.400(e) and 300.415(j). In accordance with 40 C.F.R. § 300.415(j), all on-Site actions required pursuant to this Settlement Agreement shall, to the extent practicable, as determined by EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements ("ARARs") under federal environmental or state environmental or facility siting laws.

XIII. EMERGENCY RESPONSE AND NOTIFICATION OF RELEASES

46. In the event of any action or occurrence during performance of the Work which causes or threatens a release of Waste Material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Respondent shall immediately take all appropriate action. Respondent shall take these actions in accordance with all applicable provisions of this Settlement Agreement, including, but not limited to, the Health and Safety Plan, in order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondent shall also immediately notify the OSCs or, in the event of their unavailability, the on-call OSC for the Emergency Response Section of the Region 9 Superfund Division, 415-947-4400, of the incident or Site conditions. In the event that Respondent fails to take appropriate response action as required by this Paragraph, and EPA takes such action instead, Respondent shall reimburse EPA all costs of the response action not inconsistent with the NCP pursuant to Section XV (Payment of Response Costs).

47. In addition, in the event of any release of a hazardous substance from the Site in excess of reportable quantities, Respondent shall immediately notify the OSCs either in person or by phone at (415) 972-3167 and (415) 972-3063, the Region 9 Spill Response Center at 415-947-4400, and the National Response Center at (800) 424-8802. Respondent shall submit a written report to EPA within 7 days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U.S.C. § 9603(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004, *et seq.*

XIV. AUTHORITY OF ON-SCENE COORDINATOR

48. The OSCs, in consultation with NNEPA, shall be responsible for overseeing Respondent's implementation of this Settlement Agreement. Each OSC shall have the authority vested in an OSC by the NCP, including the authority to halt, conduct, or direct any Work required by this Settlement Agreement, or to direct any other removal action undertaken at the Site. Absence of the OSCs from the Site shall not be cause for stoppage of work unless specifically directed by the OSC. The lead OSC is Andrew Bain; Donn Zuroski is the alternate.

XV. PAYMENT OF RESPONSE COSTS

49. Payment for Past Response Costs.

a. Respondent shall pay EPA all Past Response Costs incurred related to the Mariano Mine Site not inconsistent with the NCP. EPA has provided Respondent with a cost summary, which includes direct and indirect costs incurred by EPA and its contractors. EPA shall send Respondent one or more fully reconciled cost summaries ("Reconciled Summaries"). Within 60 days of receiving a Reconciled Summary of Past Costs for the Site, Respondent shall pay the total response costs shown therein in accordance with the instructions provided in

paragraph 50.d. and e. In the event that Respondent does not make timely payments, Interest and Stipulated Penalties may accrue.

b. The total amount to be paid by Respondent pursuant to Paragraph 49.a shall be deposited by EPA in the **Mariano Lake Mine Site Special Account** to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

50. Payments for Future Response Costs, Including Interest.

a. Respondent shall pay EPA all Future Response Costs incurred related to or for the Interim Removal Action as described in this AOC, the SOW, and/or the approved Work Plans not inconsistent with the NCP.

b. Within 30 days of the Effective Date, Respondent shall pay to EPA $142,000 in prepayment of Future Response Costs. The total amount paid shall be deposited by EPA in the Mariano Lake Mine Site Special Account, within the EPA Hazardous Substance Superfund. These funds shall be retained and used to conduct or finance future response actions at or in connection with the Site.

c. On a periodic basis, EPA will send Respondent a bill requiring payment that includes a Region 9 cost summary, which includes the direct and indirect costs incurred by EPA and its contractors for the Site. Respondent shall make all payments within 30 days of Respondent's receipt of each bill requiring payment, except as otherwise provided below.

d. Payment by Respondent to EPA shall be made by mailing a certified or cashier's check to the following address:

US Environmental Protection Agency
Superfund Payments
Cincinnati Finance Center
PO Box 979076
St. Louis, MO 63197-9000

e. At the time of payment, Respondent shall send notice that the payment has been made to both

EPA Cincinnati Finance Office
26 Martin Luther King Drive
Cincinnati, Ohio 45268

and

Andrew Bain (Mail Code: SFD-6-2)
U.S. EPA Region 9
75 Hawthorne St.
San Francisco, CA 94105

f. If Respondent prefers to pay by EFT, Respondent may request that EPA provide EFT instructions for making payments pursuant to this AOC

g. All payments shall be accompanied by a statement identifying the name and address of the party making payment, the Site name, the EPA Region and Site/Spill ID Number 09TA. Respondent shall also specify that the payment is for Past Response Costs or Future Response Costs and/or Interest, in response to a billing on a specified date.

h. After EPA issues the Notice of Completion of Work pursuant to Section XXVIII and a final accounting of Future Response Costs (including crediting Settling Defendants for any amounts received under Paragraphs 50.b (prepayment) or 50.c (periodic bill), EPA will apply any unused amount paid by Respondent pursuant to Paragraphs 50.b or 50.c to any other unreimbursed response costs or response actions remaining at the Site, or, if there are not other such costs or actions, remit and return to Respondent any unused amount of the funds paid by Respondent pursuant to Paragraphs 50.b or 50.c. Any decision by EPA to apply unused amounts to unreimbursed response costs or response actions remaining at the Site shall not be subject to challenge by Respondent pursuant to the dispute resolution provisions of this Consent Decree or in any other forum.

51. In the event that payments for Past Response Costs are not made within 60 days of Respondent's receipt of a bill for such costs, Respondent shall pay Interest on the unpaid balance. In the event that payments for Future Response Costs are not made within 30 days of Respondent's receipt of a bill, Respondent shall pay Interest, on the unpaid balance. Interest on Past Response Costs shall begin to accrue on the Effective Date and shall continue to accrue until the date of the bill for those costs. In the event of a failure to pay Future Response Costs within 30 days of Respondent's receipt of a bill, Interest on Future Response Costs shall begin to accrue on the date of the bill and shall continue to accrue until the date of payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondent's failure to make timely payments under this Section, including but not limited to, payment of stipulated penalties pursuant to Section XVIII.

52. Respondent may dispute all or part of a bill for Past Response Costs and/or Future Response Costs submitted under this Settlement Agreement, if Respondent alleges that EPA has made an accounting error, or if Respondent alleges that a cost item is inconsistent with the NCP. If any dispute over costs is resolved before payment is due, the amount due will be adjusted as agreed by the Parties. If the dispute is not resolved before payment is due, Respondent shall pay the full amount of the uncontested costs to EPA as specified in Paragraph 50 on or before the due date. Within the same time period, Respondent shall pay the full amount of the contested costs into an interest-bearing escrow account. Respondent shall simultaneously transmit a copy of both checks to the persons listed in Paragraph 50.d. above. Respondent shall ensure that the prevailing party or parties in the dispute shall receive the amount upon which they prevailed from the escrow funds plus interest within ten (10) days after the dispute is resolved.

XVI. DISPUTE RESOLUTION

53. Unless otherwise expressly provided for in this Settlement Agreement, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes

arising under this Settlement Agreement. The Parties shall attempt in good faith to resolve any disagreements concerning this Settlement Agreement expeditiously and informally.

54. If Respondent objects to any EPA action taken pursuant to this Settlement Agreement, including billings for Past Response Costs or Future Response Costs, Respondent shall notify EPA in writing of its objection(s) within sixty (60) days of receiving a bill for Past Costs and within thirty days of receiving a bill for Future Costs, or within 30 days of any other action that Respondent objects to, unless the objection(s) has/have been resolved informally. EPA and Respondent shall have thirty (30) days from EPA's receipt of Respondent's written objection(s) to resolve the dispute through formal negotiations (the "Negotiation Period"). The Negotiation Period may be extended at the sole discretion of EPA.

55. Any agreement reached by the parties pursuant to this Section shall be in writing and shall, upon signature by both parties, be incorporated into and become an enforceable part of this Settlement Agreement. If the Parties are unable to reach an agreement within the Negotiation Period, an EPA management official at the Division Director level or higher will issue a written decision on the dispute to Respondent. EPA's decision shall be incorporated into and become an enforceable part of this Settlement Agreement. Respondent's obligations under this Settlement Agreement shall not be tolled by submission of any objection for dispute resolution under this Section. Following resolution of the dispute, as provided by this Section, Respondent shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with EPA's decision, whichever occurs.

XVII. FORCE MAJEURE

56. Respondent agrees to perform all requirements of this Settlement Agreement within the time limits established under this Settlement Agreement, unless the performance is delayed by a *force majeure*. For purposes of this Settlement Agreement, a *force majeure* is defined as any event arising from causes beyond the control of Respondent, or of any entity controlled by Respondent, including but not limited to its contractors and subcontractors, which delays or prevents performance of any obligation under this Settlement Agreement despite Respondent's best efforts to fulfill the obligation. *Force majeure* does not include financial inability to complete the Work, increased cost of performance, or failure to attain performance standards.

57. If any event occurs or has occurred that may delay the performance of any obligation under this Settlement Agreement, whether or not caused by a *force majeure* event, Respondent shall notify EPA orally within forty-eight (48) hours of when Respondent first knew that the event might cause a delay. Within seven (7) days thereafter, Respondent shall provide to EPA in writing an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondent's rationale for attributing such delay to a *force majeure* event if it intends to assert such a claim; and a statement as to whether, in the opinion of Respondent, such event may cause or contribute to an endangerment to public health, welfare or the environment. Failure to comply with the above requirements shall preclude Respondent from asserting any claim of *force*

majeure for that event for the period of time of such failure to comply and for any additional delay caused by such failure.

58. If EPA agrees that the delay or anticipated delay is attributable to a *force majeure* event, the time for performance of the obligations under this Settlement Agreement that are affected by the *force majeure* event will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a *force majeure* event, EPA will notify Respondent in writing of its decision. If EPA agrees that the delay is attributable to a *force majeure* event, EPA will notify Respondent in writing of the length of the extension, if any, for performance of the obligations affected by the *force majeure* event.

XVIII. STIPULATED PENALTIES

59. Respondent shall be liable to EPA for stipulated penalties in the amounts set forth in Paragraphs 60 and 61, below, for failure to comply with the requirements of this Settlement Agreement specified below, unless excused under Section XVII (*Force Majeure*). "Compliance" by Respondent shall include completion of the activities under this Settlement Agreement or any work plan or other plan approved under this Settlement Agreement identified below in accordance with all applicable requirements of law, this Settlement Agreement, and any plans or other documents approved by EPA pursuant to this Settlement Agreement and within the specified time schedules established by and approved under this Settlement Agreement.

60. Stipulated Penalty Amounts - Major.

a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in Paragraph 60.b:

Penalty Per Violation Per Day	Period of Noncompliance
$1,000	1st through 14th day
$1,500	15th through 30th day
$2,000	31st day and beyond

b. Compliance Milestones

i. Failure to timely submit a Final Report meeting the requirements of this AOC and the SOW;

ii. Failure to make a payment when due.

61. Stipulated Penalty Amounts - Other. The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate reports or other written documents, failure to timely perform actions pursuant to this Settlement Agreement, or other noncompliance other than those specified in the preceding Paragraph:

Penalty Per Violation Per Day	Period of Noncompliance
$500	1st through 14th day
$1,000	15th through 30th day
$2,000	31st day and beyond

62. In the event that EPA assumes performance of a portion or all of the Work pursuant to the provisions of this AOC, Respondent shall be liable for a stipulated penalty in the amount of $250,000.

63. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: 1) with respect to a deficient submission under Section VIII (Work to be Performed), during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies Respondent of any deficiency; and 2) with respect to a decision by the EPA Management Official at the Division Director level or higher, under Section XVI (Dispute Resolution), during the period, if any, beginning on the 21st day after the Negotiation Period begins until the date that the EPA management official issues a final decision regarding such dispute. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Settlement Agreement.

64. Following EPA's determination that Respondent has failed to comply with a requirement of this Settlement Agreement, EPA may give Respondent written notification of the failure and describe the noncompliance. EPA may send Respondent a written demand for payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether EPA has notified Respondent of a violation.

65. All penalties accruing under this Section shall be due and payable to EPA within 30 days of Respondent's receipt from EPA of a demand for payment of the penalties, unless Respondent invokes the dispute resolution procedures under Section XVI (Dispute Resolution). All payments to EPA under this Section shall be paid by certified or cashier's check(s) made payable to "EPA Hazardous Substances Superfund," shall be mailed to:

US Environmental Protection Agency
Fines and Penalties
Cincinnati Finance Center
PO Box 979077
St. Louis, MO 63197-9000

A memo accompanying the payment shall indicate that the payment is for stipulated penalties, and shall reference the EPA Region and Site/Spill ID Number 09SR, the EPA docket number for

this action, and the name and address of the party making payment. Copies of check(s) paid pursuant to this Section, and any accompanying transmittal letter(s), shall be sent to EPA as provided in Paragraph 24.

66. The payment of penalties shall not alter in any way Respondent's obligation to complete performance of the Work required under this Settlement Agreement.

67. Penalties shall continue to accrue during any dispute resolution period, but need not be paid until 15 days after the dispute is resolved by agreement or by receipt of EPA's decision.

68. If Respondent fails to pay stipulated penalties when due, EPA may institute proceedings to collect the penalties, as well as Interest. Respondent shall pay Interest on the unpaid balance, which shall begin to accrue on the date of demand made pursuant to Paragraph 65. Nothing in this Settlement Agreement shall be construed as prohibiting, altering, or in any way limiting the ability of EPA to seek any other remedies or sanctions available by virtue of Respondent's violation of this Settlement Agreement or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Sections 106(b) and 122(*l*) of CERCLA, 42 U.S.C. §§ 9606(b) and 9622(*l*), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3). Provided, however, that EPA shall not seek civil penalties pursuant to Section 106(b) or 122(*l*) of CERCLA or punitive damages pursuant to Section 107(c)(3) of CERCLA for any violation for which a stipulated penalty is provided herein, except in the case of a willful violation of this Settlement Agreement or in the event that EPA assumes performance of a portion or all of the Work pursuant to Section XX, Paragraph 72 (Work Takeover). Notwithstanding any other provision of this Section, EPA may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Settlement Agreement.

XIX. COVENANT NOT TO SUE BY EPA

69. In consideration of the actions that will be performed and the payments that will be made by Respondent under the terms of this Settlement Agreement, and except as otherwise specifically provided in this Settlement Agreement, EPA covenants not to sue or to take administrative action against Respondent pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a), for performance of the Work and for recovery of Past Response Costs and Future Response Costs. This covenant not to sue is conditioned upon the complete and satisfactory performance by Respondent of their obligations under this Settlement Agreement, including, but not limited to, payment of Past Response Costs and Future Response Costs pursuant to Section XV. This covenant not to sue extends only to Respondent and does not extend to any other person.

XX. RESERVATIONS OF RIGHTS BY EPA

70. Except as specifically provided in this Settlement Agreement, nothing herein shall limit the power and authority of EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid

waste on, at, or from the Site. Further, nothing herein shall prevent EPA from seeking legal or equitable relief to enforce the terms of this Settlement Agreement, from taking other legal or equitable action as it deems appropriate and necessary, or from requiring Respondent in the future to perform additional activities pursuant to CERCLA or any other applicable law.

71. The covenant not to sue set forth in Section XIX above does not pertain to any matters other than those expressly identified therein. EPA reserves, and this Settlement Agreement is without prejudice to, all rights against Respondent with respect to all other matters, including, but not limited to:

a. claims based on a failure by Respondent to meet a requirement of this Settlement Agreement;

b. liability for costs not included within the definitions of Past Response Costs and/or Future Response Costs;

c. liability for performance of any response action other than the Work;

d. criminal liability;

e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

f. liability arising from the past, present, or future disposal, release or threat of release of Waste Materials outside of the Site; and

g. liability for costs incurred or to be incurred by the Agency for Toxic Substances and Disease Registry, or other Federal agencies, related to the Site.

72. Work Takeover.

a. In the event EPA determines that Respondent (i) has ceased implementation of any portion of the Work, or (ii) is seriously or repeatedly deficient or late in its performance of the Work, or (iii) is implementing the Work in a manner which may cause an endangerment to human health or the environment, EPA may issue a written notice ("Work Takeover Notice") to the Respondent. Any Work Takeover Notice issued by EPA will specify the grounds upon which such notice was issued and will provide Respondent a period of 10 days within which to remedy the circumstances giving rise to EPA's issuance of such notice.

b. If, after expiration of the 10-day notice period specified in subparagraph a. of this paragraph, Respondent has not remedied to EPA's satisfaction the circumstances giving rise to EPA's issuance of the relevant Work Takeover Notice, EPA may at any time thereafter assume the performance of all or any portions of the Work as EPA deems necessary ("Work Takeover"). EPA shall notify Respondent in writing (which writing may be electronic) if EPA determines that implementation of a Work Takeover is warranted under this subparagraph b.

c. Respondent may invoke the procedures set forth in Section XVI (Dispute Resolution), Paragraph 54, to dispute EPA's implementation of a Work Takeover under subparagraph b. of this paragraph. However, notwithstanding Respondent's invocation of such dispute resolution procedures, and during the pendency of any such dispute, EPA may in its sole discretion commence and continue a Work Takeover under subparagraph b. of this paragraph until the earlier of (i) the date that Respondent remedies, to EPA's satisfaction, the circumstances giving rise to EPA's issuance of the relevant Work Takeover Notice or (ii) the date that a final decision is rendered in accordance with Section XVI (Dispute Resolution), requiring EPA to terminate such Work Takeover.

d. After commencement and for the duration of any Work Takeover, EPA shall have immediate access to and benefit of any performance guarantee(s) provided pursuant to Section XXVI (Performance Guarantee) of this Settlement Agreement in accordance with the provisions of Paragraph 90 of that Section. If and to the extent that EPA is unable to secure the resources guaranteed under any such performance guarantee(s) and the Respondent fails to remit a cash amount up to but not exceeding the estimated cost of the remaining Work to be performed, all in accordance with the provisions of Section XXVI (Performance Guarantee), any unreimbursed costs incurred by EPA in performing Work under the Work Takeover shall be considered Future Response Costs that Respondent shall pay pursuant to Section XV (Payment of Response Costs).

XXI. COVENANT NOT TO SUE BY RESPONDENT

73. Respondent covenants not to sue and agrees not to assert any claims or causes of action against the United States, or its response action contractors or employees, with respect to the Work, Past Response Costs, Future Response Costs or this Settlement Agreement, including, but not limited to:

a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund established by 26 U.S.C. § 9507, based on Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;

b. any claim arising out of response actions at or in connection with the Site, including any claim under the United States Constitution, the New Mexico State Constitution, the Navajo Nation Code or the common law of the Navajo Nation, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law; or

c. any claim against the United States pursuant to Sections 107 and 113 of CERCLA, 42 U.S.C. §§ 9607 and 9613, relating to the Site.

74. These covenants not to sue shall not apply in the event the United States brings a cause of action or issues an order pursuant to the reservations set forth in Paragraphs 71(b), (c), and (e) - (g), but only to the extent that Respondent's claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

75. [Deleted.]

76. Nothing in this Agreement shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

XXII. OTHER CLAIMS

77. By issuance of this Settlement Agreement, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondent. The United States or EPA shall not be deemed a party to any contract entered into by Respondent or its directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Settlement Agreement.

78. Except as expressly provided in Section XIX (Covenant Not to Sue by EPA), nothing in this Settlement Agreement constitutes a satisfaction of or release from any claim or cause of action against Respondent or any person not a party to this Settlement Agreement, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States for costs, damages and interest under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

79. No action or decision by EPA pursuant to this Settlement Agreement shall give rise to any right to judicial review, except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XXIII. CONTRIBUTION

80. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and that Respondent is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), or as may be otherwise provided by law, for "matters addressed" in this Settlement Agreement. The "matters addressed" in this Settlement Agreement are the Work, Past Response Costs and Future Response Costs.

81. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. § 9613(f)(3)(B), pursuant to which Respondent has, as of the Effective Date, agreed to resolve its liability to the United States for the Work, Past Response Costs and Future Response Costs.

82. Nothing in this Settlement Agreement precludes the United States or Respondent from asserting any claims, causes of action, or demands for indemnification, contribution, or cost recovery against any persons not parties to this Settlement Agreement. Nothing herein diminishes the right of the United States, pursuant to Sections 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2)-(3), to pursue any such persons to obtain additional response costs or response action and to enter into any settlements that give rise to contribution protection pursuant to Section 113(f)(2).

XXIV. INDEMNIFICATION

83. Respondent shall indemnify, save and hold harmless the United States, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Respondent, its officers, directors, employees, agents, contractors, or subcontractors, in carrying out actions pursuant to this Settlement Agreement. In addition, Respondent agrees to pay the United States all costs incurred by the United States, including but not limited to attorneys fees and other expenses of litigation and settlement, arising from or on account of claims made against the United States based on negligent or other wrongful acts or omissions of Respondent, its officers, directors, employees, agents, contractors, subcontractors and any persons acting on its behalf or under their control, in carrying out activities pursuant to this Settlement Agreement. The United States shall not be held out as a party to any contract entered into by or on behalf of Respondent in carrying out activities pursuant to this Settlement Agreement. Neither Respondent nor any such contractor shall be considered an agent of the United States.

84. The United States shall give Respondent notice of any claim for which the United States plans to seek indemnification pursuant to this Section and shall consult with Respondent prior to settling such claim.

85. Respondent waives all claims against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States arising from or on account of any contract, agreement, or arrangement between Respondent and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays. In addition, Respondent shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between Respondent and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

XXV. INSURANCE

86. At least 7 days prior to commencing any on-Site work under this Settlement Agreement, Respondent shall secure, and shall maintain for the duration of this Settlement Agreement, comprehensive general liability insurance and automobile insurance with limits of one million dollars, combined single limit. Within the same time period, Respondent shall provide EPA with certificates of such insurance and a copy of each insurance policy. In addition, for the duration of the Settlement Agreement, Respondent shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Respondent in furtherance of this Settlement Agreement. If Respondent demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in an equal or lesser amount, then Respondent needs to provide only that portion of the insurance described above which is not maintained by such contractor or subcontractor.

XXVI. PERFORMANCE GUARANTEE

87. In order to ensure the full and final completion of the Work, Respondent shall, within 120 days of the Effective Date, establish and maintain a Performance Guarantee for the benefit of EPA in the amount of $1,000,000 (hereinafter "Estimated Cost of the Work") in one or more of the following forms, which must be satisfactory in form and substance to EPA:

a. A surety bond unconditionally guaranteeing payment and/or performance of the Work that is issued by a surety company among those listed as acceptable sureties on Federal bonds as set forth in Circular 570 of the U.S. Department of the Treasury;

b. One or more irrevocable letters of credit, payable to or at the direction of EPA, that is issued by one or more financial institution(s) (i) that has the authority to issue letters of credit and (ii) whose letter-of-credit operations are regulated and examined by a U.S. Federal or State agency;

c. A trust fund established for the benefit of EPA that is administered by a trustee (i) that has the authority to act as a trustee and (ii) whose trust operations are regulated and examined by a U.S. Federal or State agency;

d. A policy of insurance that (i) provides EPA with acceptable rights as a beneficiary thereof; and (ii) is issued by an insurance carrier (a) that has the authority to issue insurance policies in the applicable jurisdiction(s) and (b) whose insurance operations are regulated and examined by a State agency;

e. A demonstration by Respondent that Respondent meets the financial test criteria of 40 C.F.R. § 264.143(f) with respect to the Estimated Cost of the Work, provided that all other requirements of 40 C.F.R. § 264.143(f) are satisfied.

88. If at any time during the effective period of this Settlement Agreement, the Respondent provides a Performance Guarantee for completion of the Work by means of a demonstration or guarantee pursuant to Paragraph 87(e) above, Respondent shall also comply with the other relevant requirements of 40 C.F.R. § 264.143(f), 40 C.F.R. § 264.151(f), and 40 C.F.R. § 264.151(h)(1) relating to these methods unless otherwise provided in this Settlement Agreement, including but not limited to (i) the initial submission of required financial reports and statements from the relevant entity's responsible corporate official and independent certified public accountant; (ii) the annual re-submission of such reports and statements within ninety days after the close of each such entity's fiscal year; and (iii) the notification of EPA within ninety days after the close of any fiscal year in which such entity no longer satisfies the financial test requirements set forth at 40 C.F.R. § 264.143(f)(1). For purposes of the Performance Guarantee methods specified in this Section, references in 40 C.F.R. Part 264, Subpart H, to "closure," "post-closure," and "plugging and abandonment" shall be deemed to refer to the Work required under this Settlement Agreement, and the terms "current closure cost estimate" "current post-closure cost estimate," and "current plugging and abandonment cost estimate" shall be deemed to refer to the Estimated Cost of the Work.

89. In the event that EPA determines at any time that a Performance Guarantee provided by Respondent pursuant to this Section is inadequate or otherwise no longer satisfies the requirements set forth in this Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, or in the event that Respondent becomes aware of information indicating that a Performance Guarantee provided pursuant to this Section is inadequate or otherwise no longer satisfies the requirements set forth in this Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, Respondent, within thirty days of receipt of notice of EPA's determination or, as the case may be, within thirty (30) days of Respondent becoming aware of such information, shall obtain and present to EPA for approval a proposal for a revised or alternative form of Performance Guarantee listed in Paragraph 87 of this Settlement Agreement that satisfies all requirements set forth in this Section XXVI. In seeking approval for a revised or alternative form of Performance Guarantee, Respondent shall follow the procedures set forth in Paragraph 91(b)(ii) of this Settlement Agreement. Respondent's inability to post a Performance Guarantee for completion of the Work shall in no way excuse performance of any other requirements of this Settlement Agreement, including, without limitation, the obligation of Respondent to complete the Work in strict accordance with the terms hereof.

90. The commencement of any Work Takeover pursuant to Paragraph 72 of this Settlement Agreement shall trigger EPA's right to receive the benefit of any Performance Guarantee(s) provided pursuant to Paragraph 87, and at such time EPA shall have immediate access to resources guaranteed under any such Performance Guarantee(s), whether in cash or in kind, as needed to continue and complete the Work assumed by EPA under the Work Takeover. If for any reason EPA is unable to promptly secure the resources guaranteed under any such Performance Guarantee(s), whether in cash or in kind, necessary to continue and complete the Work assumed by EPA under the Work Takeover, or in the event that the Performance Guarantee involves a demonstration of satisfaction of the financial test criteria pursuant to Paragraph 87(e), Respondent shall immediately upon written demand from EPA deposit into an account specified by EPA, in immediately available funds and without setoff, counterclaim, or condition of any kind, a cash amount up to but not exceeding the estimated cost of the remaining Work to be performed as of such date, as determined by EPA.

91. Modification of Amount and/or Form of Performance Guarantee

a. Reduction of Amount of Performance Guarantee. If Respondent believes that the estimated cost to complete the remaining Work has diminished below the amount set forth in Paragraph 87 above, Respondent may, on any anniversary date of entry of this Settlement Agreement, or at any other time agreed to by the Parties, petition EPA in writing to request a reduction in the amount of the Performance Guarantee provided pursuant to this Section so that the amount of the Performance Guarantee is equal to the estimated cost of the remaining Work to be performed. Respondent shall submit a written proposal for such reduction to EPA that shall specify, at a minimum, the cost of the remaining Work to be performed and the basis upon which such cost was calculated. In seeking approval for a revised or alternative form of Performance Guarantee, Respondent shall follow the procedures set forth in Paragraph 91(b)(ii) of this Settlement Agreement. If EPA decides to accept such a proposal, EPA shall notify Respondent of such decision in writing. After receiving EPA's written acceptance, Respondent may reduce

the amount of the Performance Guarantee in accordance with and to the extent permitted by such written acceptance. In the event of a dispute, Respondent may reduce the amount of the Performance Guarantee required hereunder only in accordance with a final administrative or judicial decision resolving such dispute. No change to the form or terms of any Performance Guarantee provided under this Section, other than a reduction in amount, is authorized except as provided in Paragraphs 87 or 89 of this Settlement Agreement.

b. Change of Form of Performance Guarantee.

i. If, after entry of this Settlement Agreement, Respondent desires to change the form or terms of any Performance Guarantee(s) provided pursuant to this Section, Respondent may, on any anniversary date of entry of this Settlement Agreement, or at any other time agreed to by the Parties, petition EPA in writing to request a change in the form of the Performance Guarantee provided hereunder. The submission of such proposed revised or alternative form of Performance Guarantee shall be as provided in subparagraph (b)(ii) of this paragraph. Any decision made by EPA on a petition submitted under this subparagraph (b)(i) shall be made in EPA's sole and unreviewable discretion, and such decision shall not be subject to challenge by Respondent pursuant to the dispute resolution provisions of this Settlement Agreement or in any other forum.

ii. Respondent shall submit a written proposal for a revised or alternative form of Performance Guarantee to EPA which shall specify, at a minimum, the estimated cost of the remaining Work to be performed, the basis upon which such cost was calculated, and the proposed revised form of Performance Guarantee, including all proposed instruments or other documents required in order to make the proposed Performance Guarantee legally binding. The proposed revised or alternative form of Performance Guarantee must satisfy all requirements set forth or incorporated by reference in this Section. Respondent shall submit such proposed revised or alternative form of Performance Guarantee to the OSCs in accordance with Paragraph 24 of this Settlement Agreement, with a copy to Laurie Williams, Assistant Regional Counsel, USEPA Region 9, Mail Code ORC-3, 75 Hawthorne St., San Francisco CA 94105. EPA shall notify Respondent in writing of its decision to accept or reject a revised or alternative Performance Guarantee submitted pursuant to this subparagraph. Within ten days after receiving a written decision approving the proposed revised or alternative Performance Guarantee, Respondent shall execute and/or otherwise finalize all instruments or other documents required in order to make the selected Performance Guarantee(s) legally binding in a form substantially identical to the documents submitted to EPA as part of the proposal, and such Performance Guarantee(s) shall thereupon be fully effective. Respondent shall submit all executed and/or otherwise finalized instruments or other documents required in order to make the selected Performance Guarantee(s) legally binding to the EPA Regional Financial Management Officer within thirty days of receiving a written decision approving the proposed revised or alternative Performance Guarantee in accordance with Paragraph 24 of this Settlement Agreement, with a copy to Laurie Williams, Assistant Regional Counsel, USEPA Region 9, Mail Code ORC-3, 75 Hawthorne St., San Francisco CA 94105.

c. Release of Performance Guarantee. If Respondent receives written notice from EPA in accordance with Section XXVIII (Notice of Completion of Work) that the Work has

been fully and finally completed in accordance with the terms of this Settlement Agreement, or if EPA otherwise so notifies Respondent in writing, Respondent may thereafter release, cancel, or discontinue the Performance Guarantee(s) provided pursuant to this Section. Respondent shall not release, cancel, or discontinue any Performance Guarantee provided pursuant to this Section except as provided in this subparagraph. In the event of a dispute, Respondent may release, cancel, or discontinue the Performance Guarantee(s) required hereunder only in accordance with a final administrative or judicial decision resolving such dispute.

XXVII. MODIFICATIONS

92. The OSC may make modifications to any plan or schedule in writing or by oral direction, provided such modifications do not materially expand the scope of the Work Plan. Any oral modification will be memorialized in writing by EPA promptly and provided to Respondent and the Navajo Nation, but shall have as its effective date the date of the OSCs oral direction to Respondent's representative. Any other requirements of this Settlement Agreement may be modified in writing by mutual agreement of the parties. EPA and Respondent may agree to modify the Work Plan to include additional response actions.

93. If Respondent seeks permission to deviate from any approved work plan or schedule Respondent's Project Coordinator shall submit a written request to EPA for approval outlining the proposed modification and its basis. Respondent may not proceed with the requested deviation until receiving oral or written approval from the OSC pursuant to paragraph 92.

94. No informal advice, guidance, suggestion, or comment by the OSC or other EPA representatives regarding reports, plans, specifications, schedules, or any other writing submitted by Respondent shall relieve Respondent of its obligation to obtain any formal approval required by this Settlement Agreement, or to comply with all requirements of this Settlement Agreement, unless it is formally modified.

XXVIII. NOTICE OF COMPLETION OF WORK

95. When EPA determines, after consultation with NNEPA, and after EPA's review of the Final Report, that all Work has been fully performed in accordance with this Settlement Agreement, with the exception of any continuing obligations required by this Settlement Agreement, including payment of Past Response Costs, Future Response Costs or record retention, EPA will provide written notice to Respondent. If EPA determines, after consultation with NNEPA, that any such Work has not been completed in accordance with this Settlement Agreement, EPA will notify Respondent, provide a list of the deficiencies, and require that Respondent correct such deficiencies. Respondent shall correct the deficiencies and shall submit a modified Final Report in accordance with the EPA notice. Failure by Respondent to correct the deficiencies as directed by EPA shall be a violation of this Settlement Agreement.

XXIX. SEVERABILITY, INTEGRATION and APPENDICES

96. If a court issues an order that invalidates any provision of this Settlement Agreement or finds that Respondent has sufficient cause not to comply with one or more provisions of this

Settlement Agreement, Respondent shall remain bound to comply with all provisions of this Settlement Agreement not invalidated or determined to be subject to a sufficient cause defense by the court's order.

97. This Settlement Agreement and its appendix constitute the final, complete and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Settlement Agreement. The parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Settlement Agreement. The following appendix is attached to and hereby incorporated into this Settlement Agreement by this reference:

Appendix A: Scope of Work ("SOW")

XXX. EFFECTIVE DATE

98. This Settlement Agreement shall be effective upon signature by the Assistant Director of the Superfund Division, U.S. EPA Region 9 or her delegatee.

The undersigned representative of Respondent certifies that s/he is fully authorized to enter into the terms and conditions of this Settlement Agreement and to bind Chevron U.S.A. Inc.

For Respondent Chevron U.S.A. Inc.

BY: _____

(Print/Type Name) **Frank G. Soler**

(Title) **Assistant Secretary**

Agreed this 27th day of July, 2011.

It is so ORDERED and Agreed this 28th **day of** July **, 2011.**

BY: Clancy Tenley

Clancy Tenley
Assistant Director, Superfund Division
Partnerships, Land Revitalization & Cleanup Branch
U.S. Environmental Protection Agency, Region 9

ATTACHMENT A

SCOPE OF WORK
FOR ADMINISTRATIVE ORDER ON CONSENT
INTERIM REMOVAL ACTION
FOR MARIANO LAKE MINE SITE

1. Introduction

The Interim Removal Action for the Mariano Lake Mine Site ("Site" or "Mine Site") is a time-critical removal action to investigate and mitigate actual or threatened releases of hazardous substances. This Scope of Work ("SOW") specifies actions required to be completed by Chevron U.S.A. Inc., Respondent, pursuant to the July 2011 Administrative Order on Consent ("AOC") CERCLA Docket No. 2011-12. All terms used in this SOW shall be interpreted in a manner consistent with the definitions provided in the AOC. In the event of any conflict between this SOW and the AOC, the AOC shall control.

2. Description of the Site

The Site occupies approximately 31 acres. The Site and vicinity are shown in Attachment 1 (Maps). The areas to be addressed by this Scope of Work include:

(1) the Eastern Area, which occupies approximately 12.5 acres,
(2) the Western Area, which occupies approximately 18.5 acres,
(3) the Mine Entrance Road and Perimeter roads, along with their shoulders, including the roads around, between and near the Eastern and Western Areas, as shown on Attachment 1, Figure 1, comprising approximately 8,100 linear feet of roadway
(4) the Parking Area consisting of approximately 3.66 acres to the east of the Eastern Area,
(5) the Bermed Area, an area of approximately one acre to the north of the Western Area,
(6) Unnamed Washes #1 and #2.

In addition, Respondent may be required to characterize additional "Step Out" areas in the field, if EPA determines that this is appropriate based on exceedances of the investigation level at the margins of the six areas described above, or if additional areas of mine waste are identified in proximity to the Mine Site.

Cultural Resources Survey: Prior to any intrusive work on Site, Respondent shall perform a Cultural Resources Survey. EPA has provided Respondent with information regarding an archeological consultant familiar with the Navajo Nation who may be able to assist with conducting the Cultural Resources Survey. Additional information may be available at:

- National Historic Preservation Act of 1966, Section 106, 16 U.S.C. 470f
- Executive Order 11593, Protection of and Enhancement of the Cultural Environment
- Executive Order 13007, Indian Sacred Sites
- 36 CFR Part 800

EPA records indicate that the Mariano Lake Mine operated with a single shaft at a depth of approximately 519 feet below ground surface, and that the shaft was located in the Eastern Area of the site. The Western Area of the site was reportedly used as an evaporation pond for mine water.

3. Four Phases of the Work - Overview

This SOW requires four phases of work, to be performed pursuant to approved work plans. These four phases may overlap to some degree:

Phase 1 – Scanning, Background Study and Signage: Respondent will perform transect gamma scans of the Site areas shown in Attachment 1 (Figure 1), and perform a representative Background Study based on soil sampling, consistent with the Multi-Agency Radiation Survey and Site Investigation Manual ("MARSSIM") Scanning measurements must meet a scan Minimum Detectable Concentration (MDC) of 50% of the Investigation Level. In addition, Respondent will create and post bilingual (English and Navajo) signs to warn the public about potential hazards at the Site.

Phase 2 - Fencing: Based on results of the Phase 1 gamma scan, Respondent will repair and install fences to exclude livestock and mitigate potential ongoing exposures to contamination at three Site areas, specifically at the Eastern Area, Western Area and Parking Area. At the Eastern and Western Areas, Respondent will repair existing fencing and install locking gates. At the Parking Area, Respondent will construct new fencing with an appropriate gate and lock to restrict access.

Phase 3 - Removal Site Evaluation ("RSE"): Respondent will characterize the lateral and vertical extent of contamination in surface and subsurface soils and sediments in all six areas of the Site defined in Section 2 above and depicted in Attachment 1, Figure 1 as well as any additional areas identified as a result of the transect scans in Phase 1. Respondent will use MARSSIM as the over-arching guidance for the RSE investigation. Respondent will also sample and analyze groundwater from two existing wells in the vicinity of the Mariano Lake Mine Site. The approximate locations of these wells are shown in Attachment 1, Figure 1.

Phase 4 – Paving Roads and Applying Sealant to Road Shoulders and Parking Area: Respondent will reduce exposures at the Site by covering those portions of the Road, Road Shoulders and Parking Area that exceed EPA's site-specific risk-based concentration. Respondent shall apply chip seal or paving for Road driving surfaces and tackifier to the Road Shoulders and the Parking Area.

4. General Requirements

4.1 Priority Media: Priority media to be addressed at this Site include soils, sediments, dust, groundwater and surface water, which present the greatest potential risk to human health and the environment.

4.2 Contaminants of Concern: Contaminants of Concern (COC) include radium 226 (^{226}Ra), the primary risk driver associated with uranium ore extraction. Radiological contamination has been observed at the Mine Site areas, including the adjacent roads, the Mine Entrance Road to the north of the Site and the Parking Area. Contaminants have been documented on the surface of the Roads and in soils on the Road Shoulders. All samples from the Mine Area shall be analyzed for ^{226}Ra activity and total uranium and the following stable metals: arsenic, molybdenum, selenium, vanadium, and mercury.

4.3. Additional Analytes at Selected Locations: In addition to ^{226}Ra activity and total uranium, Respondent shall analyze selected site soil and sediment samples from Unnamed Wash #1 and #2 from selected locations for contaminants of concern frequently associated with mining activities. The full suite of contaminants for these analyses shall include stable metals, volatile organic compounds, semi-volatile organic compounds, PCBs, total petroleum hydrocarbons and explosives, including perchlorate.

4.4 Investigation Level: For the purposes of this RSE, EPA has selected an investigation level for ^{226}Ra, of 1.24 pCi/g above background, as determined at another site. This investigation level is based on EPA's preliminary remediation goal ("PRG") for ^{226}Ra plus daughters for a residential risk scenario at another site and is temporarily used here as a guide. Scanning measurements must meet a scan MDC of 50% of the Investigation Level.

4.5 Removal Action Level: For the purposes of this SOW, Respondents will propose and EPA will select an appropriate ^{226}Ra level above background defined in the Phase 1 Background Study and in accordance with MARSSIM guidance.

4.6 Multi-Agency Radiation Survey & Site Investigation Manual ("MARSSIM"): The activities conducted as part of this removal action shall be conducted in a manner consistent with MARSSIM specifications to facilitate implementation of a final status survey at the completion of all mitigation activities

4.7 Notice of Fieldwork and Sampling: Respondent shall provide US EPA and Navajo Nation EPA (collectively "the Agencies") with at least two (2) working days notice prior to conducting any on-site activities. In addition, Respondent shall provide 2-week notice of all sampling activities, including soil, sediment and groundwater sampling and scanning. This will assist the Agencies in providing appropriate oversight and notice to potentially affected residents.

4.8 Split Samples: Upon request from EPA, Respondents shall provide 10% splits to be analyzed by EPA's laboratory for corroboration analysis.

4.9 Data Reports: Respondents shall provide all data in both electronic form and hard copy. Data should be provided in Microsoft Access or Excel files. In addition, maps should be provided as Arc GIS shape files.

5. Detailed Requirements for the Four Phases of the Work

5.1. Phase 1 – Transect Gamma Scan and Background Study:

5.1.1 Transect Gamma Scan: Respondent shall conduct a gamma scan of all areas impacted or potentially impacted by uranium mining agreed upon by EPA and the respondent, as shown on Attachment 1, Figure 1, including the 6 areas of the Site described in Section 2 (Description of the Site) above. The transect scan is designed to cover approximately 10 % of the mine site areas that were originally surveyed during the Mariano Lake Radioactive Structures Assessment (Ecology & Environment 2010, provided as Attachment 4) with an appropriate step out to estimate the extent of contamination. The Step outs may require additional scanning to avoid missing anomalies. Stationary point scanning is not advised.

5.1.2 Background Study: Respondent shall conduct a background study consistent with MARSSIM, to supplement existing background data (Mariano Lake Radioactive Structures Assessment Report, Navajo Nation, New Mexico, Ecology and Environment, August 2010, provided as Attachment 4). Respondent shall propose at least one reference area based on geologically similar soils, upgradient and upwind of the Site in an area undisturbed by uranium mining. A gamma scan of the background area(s) will be performed, in addition to collection and testing of surficial soil for ^{226}Ra activity total uranium, and stable metals (including arsenic, molybdenum, selenium, vanadium, and mercury).

5.1.3 Signage: Respondent shall install bilingual (English and Navajo) signs on each cardinal direction of the two Mine Areas (Eastern & Western). See Attachment 2, which provides an example of an appropriate bilingual sign design addressing Abandoned Uranium Mines on the Navajo Nation.

5.2 Phase 2 - Fence Repair and Characterization of Existing Soils/Vegetation:

5.2.1. Consistent with the results of the Phase 1 gamma scan, Respondent shall repair or replace the fences on the two Mine Areas (Eastern & Western), as needed to prevent unauthorized human and livestock access to the mine site surface. In addition, Respondent shall construct fencing for the Parking Area. The fencing for all three areas shall include an appropriate gate and lock to allow implementation of this SOW and agency oversight.

Following repairs and construction of the respective fences and gates, Respondent shall check fences and locks monthly for any damage and repair or replace, as necessary, until EPA has determined that the fencing is no longer needed. See Attachment 1, Figure 1, which shows the areas of the fence known to be in need of repair or replacement.

5.2.2 Characterization of Existing Soils and Vegetation: As soon as field work begins for Phase 2, Agronomic parameters shall be identified to help with evaluation of long-term mitigation options, including revegetation based on the model NECR (UNC) Mine Site Vegetation and Wildlife Evaluation/Revegetation Recommendations, provided as Attachment 6.

5.3 Phase 3 – Removal Site Evaluation ("RSE"):

5.3.1. Respondent shall conform its Mariano Lake Mine Site RSE to the GE/UNC Removal Site Evaluation ("RSE") Work Plan (2006), or other suitable RSE Work Plan identified by EPA, for the Mariano Lake Mine Site. The GE/UNC RSE is provided as Attachment 4. Soil samples shall be collected on a grid determined on a site-specific basis using a statistical tool (such as a Visual Sampling Plan).

5.3.2. Characterization of Surface, and Subsurface Soils and Sediments in Eastern & Western Mine Areas: Respondents shall characterize the soils at the Eastern and Western Mine Areas to a sufficient depth to confirm the absence of contamination or until bedrock is reached, as determined by a field gamma meter and confirmatory soil sampling. Respondent shall sample and analyze surface and sub-surface soils in the six areas described in Section 2 (Description of the Site) of this SOW and shown on Attachment 1 Figure 1. Sampling in all mine process areas and the step out area shall include surface sampling (0-6 inches in mine process areas and 0-2 inches in step out areas) (and then at appropriate intervals to a depth that confirms the vertical extent of contamination, as determined by a field gamma meter and confirmatory soil sampling. EPA believes that areas where wind-borne radionuclide contaminants were deposited (i.e., outside of the mine areas) may only have impacts to a few inches below ground surface and thus it is not appropriate to establish a correlation between surface gamma activity and activity concentrations in soils deeper than 0-2 inches. This would not necessarily apply to roads suspected of being impacted by spills or construction from mine waste, including the two washes, waste piles, etc. The Final Report shall discuss the rationale for particular surface sample depths (see Section 8.4 below).

5.3.3 Screening for Additional Analytes at Eastern and Western Mine Areas: Respondent shall sample and analyze soil samples at defined depth intervals from a minimum of eight locations, four from each of the Eastern and Western Mine Site Areas, for the full suite of contaminants referenced in paragraph 4.2 above. Respondent shall propose locations for the eight locations to be analyzed for the full suite of contaminants in the Field Sampling Plan/Quality Assurance Sampling and Analysis Plan (FSP/QASP) work plan(s), based on Site operational history and probable usage of solvents, acids,

bases and other materials. Final locations shall be selected by EPA, in its approval of the Phase 3 work plan. Respondents shall collect 5-point composite soil samples for each sample interval at each location.

5.3.4 Characterization of Surface and Subsurface Soil of the Roads, Road Shoulders, Parking Area, Bermed Area and Unnamed Wash Areas. Respondent shall sample and analyze surface and sub-surface soils for radium 226 and total uranium at minimum of three depth intervals at each selected location in the Road/Road Shoulders, Parking Area, Bermed Area and Unnamed Wash Areas #1 and #2. The required intervals are (0-2 inches), 1.5-2 ft, and 2.5-3 ft from the surface, or until native soils (hard rock sandstone) are encountered or the extent of contamination is reached, as determined by a field gamma meter and confirmatory soil sampling.

5.3.5 Groundwater Sampling: Respondent shall sample and analyze groundwater samples from any existing wells shown on Attachment 1, Figure 1 or identified in the field. This groundwater sampling and analysis shall be performed in accordance with the approved QASP for the NECR Mine Site provided as Attachment 7 to this SOW, or other suitable RSE Work Plan identified by EPA. However, if the wells are found to be in poor condition and unable to be sampled, or there is evidence of surface contamination due to their age, Respondent may propose that the wells not be sampled. This determination will be made by EPA during Phase 1.

5.4. Phase 4 – Mitigation of Releases from Roads, Road Shoulders and Parking Area

Respondent shall mitigate actual and potential releases of ^{226}Ra from the portions of the Roads, Road Shoulders and Parking Area that are determined to exceed the site-specific risk based concentration, based on the Background Study and subsequent Phase 3 Removal Site Evaluation. Specifically, Respondent shall address the elevated portions of the approximately 8,100 feet of perimeter roads surveyed by EPA Attachment 1, Figure 1 including the Mine Entrance Road and an additional 50 feet north of the Mine Entrance Road and the Parking Area. In these elevated areas, Respondent shall apply a sufficient quantity and quality of chip seal or asphalt paving material to prevent mitigation of potential releases from the Road driving surface and a sufficient layer of an appropriate soil tackifier to the Road Shoulders and Parking Area. To the extent feasible, these surfaces should be constructed to last for at least five years from its initial application without the need for reapplication or repairs. If chip seal is used, a minimum of a double layer of chip seal material shall be used and the constructed road surface shall be designed to provide a stable and safe road surface and an effective barrier to contaminant migration for the required five years time period. If Respondent decides to use chip seal, Respondent shall design and construct the chip seal paving project consistent with the guidance provided in the Caltrans Division of Maintenance discussion of chip seals, provided at: http://www.dot.ca.gov/hq/maint/mtag/ch5_chip_seals.pdf.) and Six Steps to A Better Chip Seal, California Chip Seal Association. Following construction, Respondent

shall maintain these measures for five years or until EPA agrees that the measures are no longer needed.

6. Work Plans

Respondent is required to develop the following work plans and to submit them for EPA review and approval or approval with modifications, consistent with the AOC. Respondent shall utilize the UNC/GE NECR Removal Site Evaluation ("RSE") Work Plan (2006), or other suitable RSE Work Plan identified by EPA, as a guide to all work plan elements. All Work Plans shall be submitted no later than 10 days after the Effective Date of the AOC, unless a different schedule is approved by EPA.

6.1 Overall Removal Action Work Plan: Respondent shall develop a plan consistent with the UNC/GE RSE Work Plan 2006, or other suitable RSE Work Plan identified by EPA. Respondent has already provided the Phase 1 work plan, which has been approved, and is provided as Attachment 3 to this SOW. The individual work plans for Phases 2, 3 and 4 of Work may be submitted separately or as part of the Overall Removal Work Plan.

6.2 Health & Safety Plan: Respondent shall develop a plan consistent with the UNC/GE RSE Work Plan 2006 and other applicable guidance. This plan shall identify all hazards and include both directives and specific operating procedures that will be used to mitigate those hazards.

6.3 Quality Assurance Project Plan: With respect to soils and sediments, Respondent shall develop a plan consistent with the UNC/GE RSE Work Plan 2006 and UNC Supplement, or other suitable RSE Work Plan(s) identified by EPA. With respect to technologically-enhanced naturally occurring radioactive material ("TENORM") in groundwater, Respondent shall develop a plan consistent with the Time-Critical Quality Assurance Sampling Plan for Radiation Assessment of Unregulated Drinking Water Sources (October 8, 2010, EPA Emergency Response Section).

6.4 Field Sampling Plan/Quality Assurance Sampling and Analysis Plan (FSP/QASP): Respondent shall develop vertical and lateral characterization and verification sampling utilizing an appropriate statistical approach and a sufficient radiological scanning approach. An approach consistent with MARSSIM should be used to insure adequate initial sampling and final status survey criteria at the conclusion of all site-wide mitigation activities for radiological constituents. Visual Sampling Plan software can be used to properly document that soil sampling approach is statistically representative.

6.5 Construction Work Plan: Specify how all construction activities will be implemented, including fencing, chip sealing of the Road and tackifier application to Road Shoulders and Parking Area. The plan shall include traffic management considerations and performance measures to ensure adequate road quality.

6.6 Approved Work Plans and Schedules: Respondent shall complete all work in accordance with the work plans and schedules approved by EPA pursuant to the AOC.

7. Schedules

The Work to be performed pursuant to the AOC and this SOW shall be performed in compliance with the following schedule, unless otherwise agreed by the parties or excused by a Force Majeure:

a. Proposed Workplan for Phase 1 (10% Scan & Background Study) – **June 6th**
b. Sign/Finalize AOC – **July 2011**
c. Proposed Workplan for Phase 2 (Fence/Sign/Storage Container) – **July 1st**
d. Field work for Phase 1 – **July 25th - 31st**
   - preliminary Phase 1 gamma scan data to Agencies – **by August 12th**
   - preliminary draft report on Phase 1 results – **by September 9th**
e. Proposed Workplan for Phase 3 (RSE Investigation) – **September 15th**
f. Field work for Phase 2 (Fences & Signage & Shipping Container, not dependent on Phase 1 results) – **by September 15th**
g. Proposed Workplan for Phase 4 (Chip Seal/Sealant) – **September 23th**
h. Field work for Phase 3 (RSE) – **September 23rd - October 14th**
i. Field work for Phase 4 (paving & tackifier, depending on Phase 1 results) – **by November 11th**
j. Completion Report (includes RSE Report) – **January 31, 2012**
k. Second Removal Action, if needed, based on RSE results – **beginning April 2012**

8. Reporting

8.1. Weekly Technical Calls: Respondents shall participate in weekly technical conference calls with EPA's project manager, EPA's consultants and Navajo Nation representatives. On the weekly call, Respondent's representatives shall provide updates on all tasks and raise issues that may need to be resolved in order to expedite completion of the Work.

8.2. Monthly Reporting – Respondent shall provide a Monthly Report to the OSC/RPM via email and US Mail, no later than the last day of the first full month following the Effective Date of the AOC, and include in each report a complete update on all field, analytic and planning activities.

8.3. Laboratory Results: A copy of all laboratory results shall be provided to EPA within 5 days of Respondent's or Respondent's consultant's receipt of such results. Laboratory results need not be validated for this submittal.

8.4. Interim Reports: Respondent shall provide an "Interim Report" no later than 30 days following the completion of fieldwork for each Phase of the Work; however, such reports may be provided as part of the relevant Monthly report.

8.5. Final RSE and Completion Report: Respondent shall provide a comprehensive Final RSE and Completion Report no later than 90 days after all field work has been completed and all analytic results from the RSE have been received. The Final Report shall integrate all data used, both existing and newly collected, into a single, coherent characterization report deliverable. This report shall be provided as specified in the AOC. As part of the Final RSE and Completion Report, Respondent shall propose post-removal site controls consistent with Section 300.415(l) of the NCP and OSWER Directive No. 9360.2-02.

9. List of Attachments

Attachment 1 – Maps of Site and Vicinity

Attachment 2 – Sample Signage for Navajo Nation Uranium Site Hazard Warning

Attachment 3 – Approved Work Plan for Phase 1 Transect Gamma Scan and Background Study

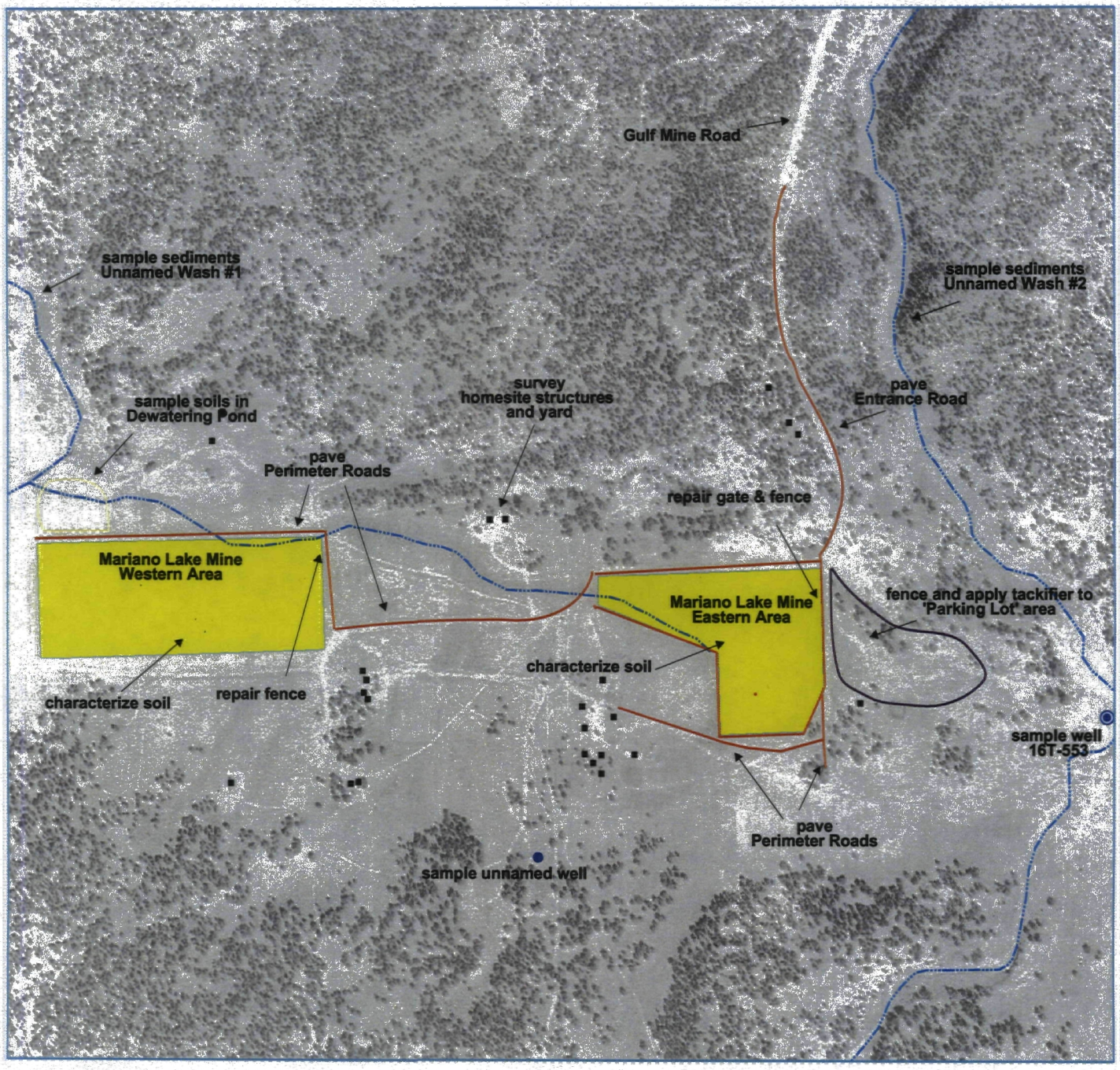
Attachment 4 – Mariano Lake Mine Structures Assessment Report (E&E, August 2010)

Attachment 5 –Northeast Church Rock Mine (NECR), United Nuclear/General Electric (UNC) Removal Site Evaluation Work Plan (MWH, 2006)

Attachment 6 – NECR (UNC) Mine Site Vegetation and Wildlife Evaluation/Revegetation Recommendations (CCA, 2009)

Attachment 7 –NECR (UNC) Mine Site - Quality Assurance Sampling Plan for Radiation Assessment of Unregulated Drinking Water Sources (EPA, 2010)

Attachment 1



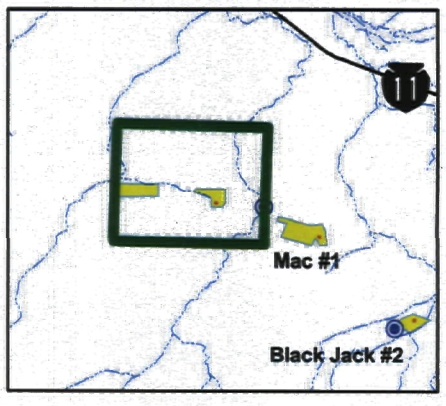
MARIANO LAKE MINE SITE
REMOVAL SITE EVALUATION AREAS

- Intermittent Stream
- Chapter
- Gamma Anomalies
- Paved Road
- Probable MLM impacts
- Structure

N
W E
S

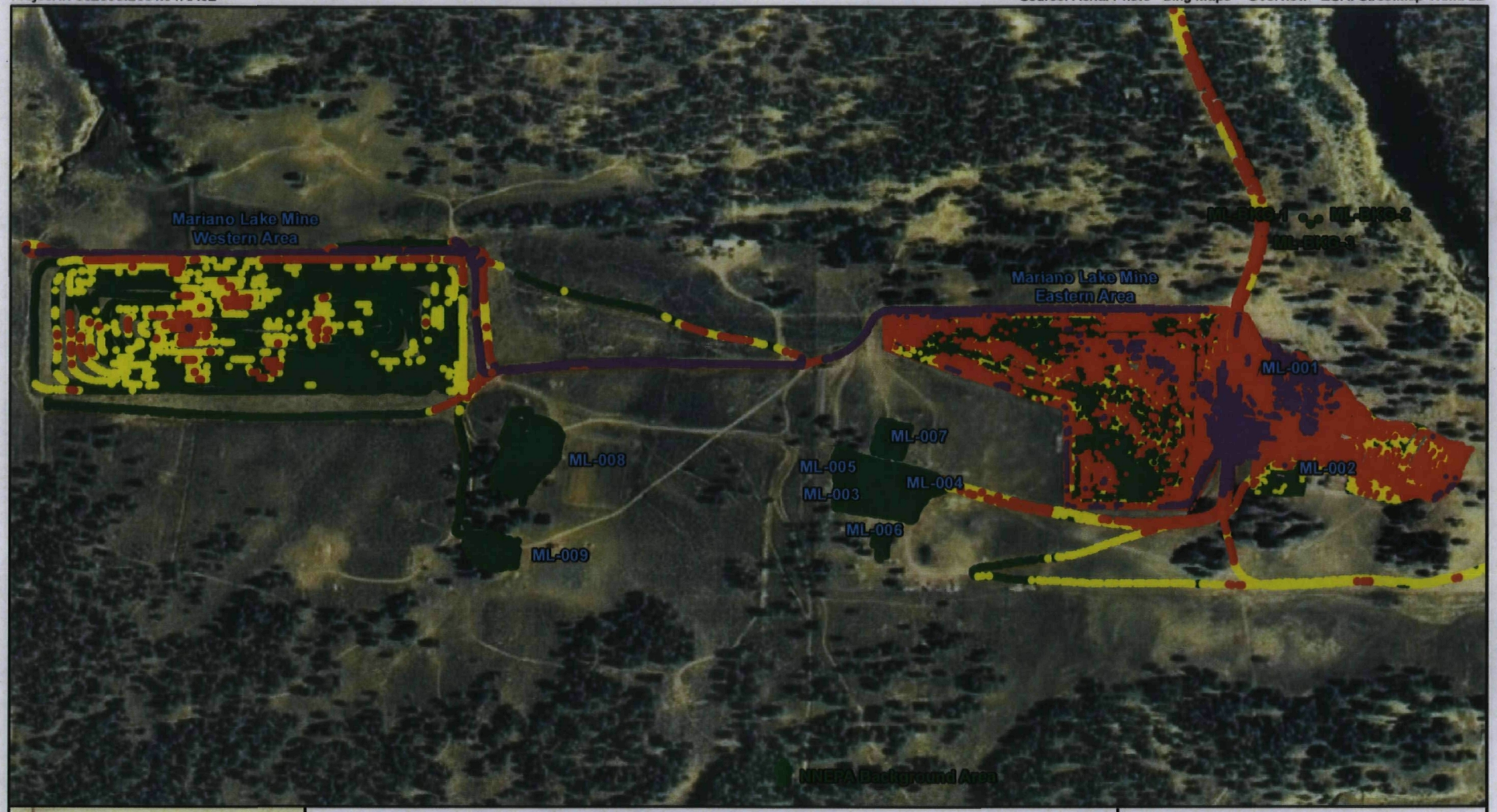
0 0.12 Miles

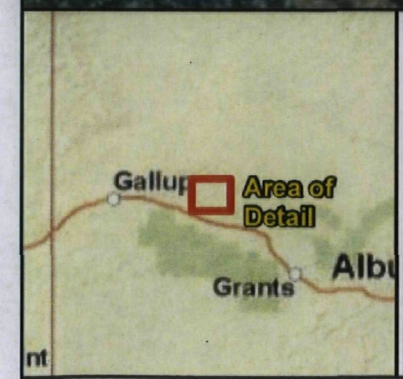
Map Scale 1:65,000



TDD: 09-09-10-0005
Project #: 002693.2064.01RA02

Source: Aerial Photo - Bing Maps - Overview - ESRI StreetMap World 2D





LEGEND

- Below investigation level
- Investigation level - 2x background
- 2x background - 5x background
- Above 5x background

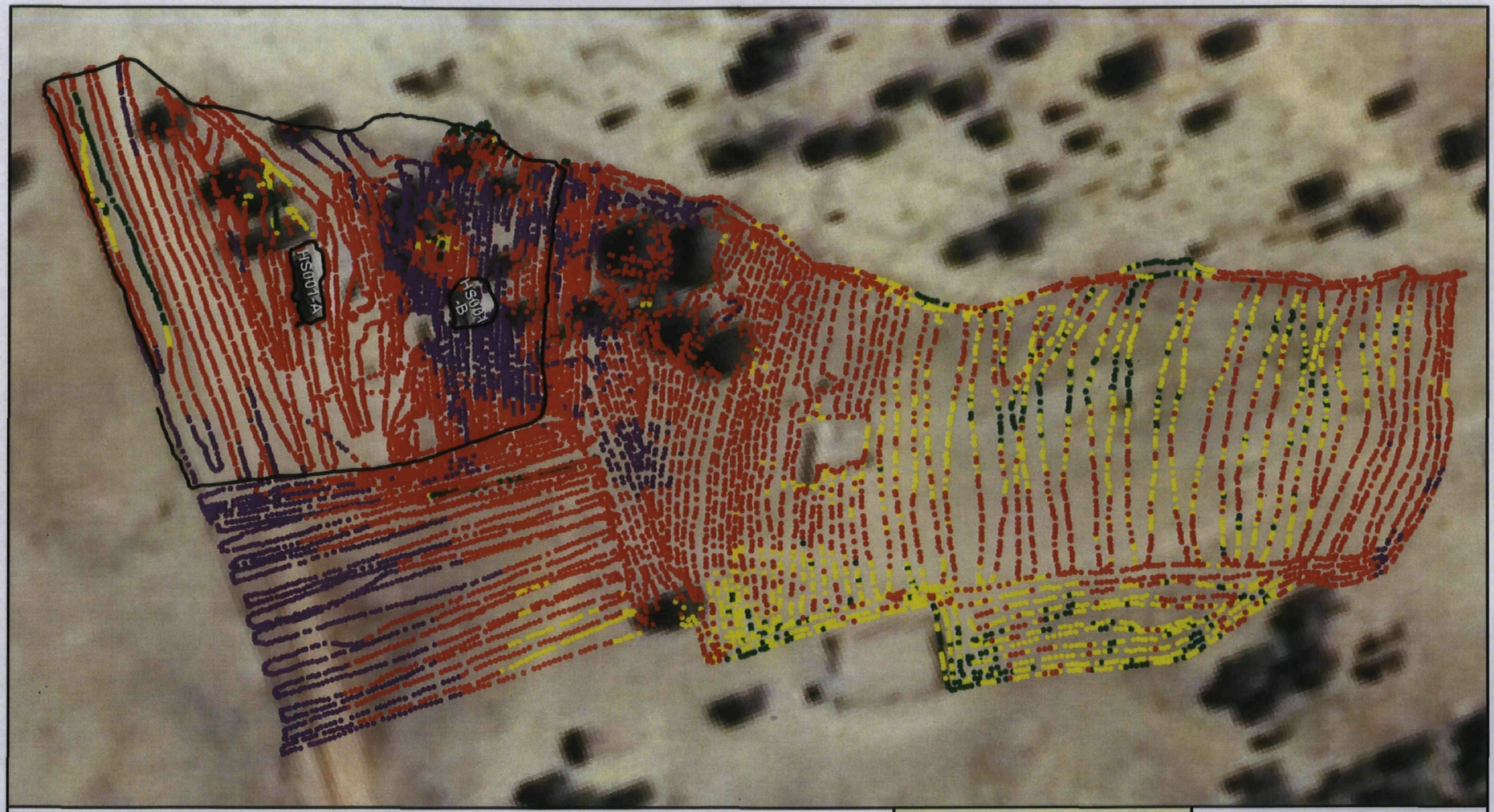
N

0 600 1,200 Feet

Figure 2
General Site Radiation Survey

Mariano Lake AUM
Radiation Assessment
Navajo Nation Reservation

ecology and environment, inc.
International Specialists in the Environment



LEGEND

- Below investigation level
- Investigation level - 2x background
- 2x background - 5x background
- Above 5x background

N

0 100 200 Feet

ML-001 Radiation Survey

Mariano Lake AUM
Radiation Assessment
Navajo Nation Reservation

ecology and environment, inc.
International Specialists in the Environment

Attachment 2


DANGER
UNAUTHORIZED PERSONNEL
KEEP OUT
Ba´ha´dzid - Doo Ko´ne´ na´ada´adá´
(DANGER - NO TRESPASSING)
US EPA
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RADIATION REMOVAL SITE
Contact Navajo Super Fund Program For
More Information At 1-800-314-1846
Or USEPA At 1-800-231-3075

Attachment 3

UNSCANNABLE MEDIA

To use the unscannable media document # 2239123
contact the Region IX Superfund Records Center

Attachment 4

Attachment 5

Attachment 6

Work Plan – United Nuclear Corporation

NE Church Rock Mine

Vegetation Evaluations Contributory to Development of Final Reclamation Considerations

1.0 INTRODUCTION

Cedar Creek Associates, Inc. (Cedar Creek) has been retained to develop and then implement a work plan specific to vegetation and revegetation considerations in support of remediation activities for United Nuclear Corporation's (UNC) Northeast Church Rock (NECR) Mine. This work plan identifies and defines methods and protocols to be utilized for vegetation evaluations required for the remediation activities. The purpose of this effort is to facilitate a determination of: 1) current floral conditions extant about the permit area and 2) revegetation potential along with revegetation plan development and recommendations to optimize the ability of revegetation to meet post-mining land use considerations. A component of the revegetation plan will document site-specific protocols for monitoring and eventual success evaluation to be used at each mine.

NECR is located approximately 16 miles Northeast of Gallup, New Mexico and occupies a permit area of about 125 acres. This area occurs primarily on lands administered by the Bureau of Indian Affairs on behalf of the Navajo Nation, but also includes a modest component of private lands. Access agreements exist for the property for the conduct of site work. Remediation activities will include lands on the Navajo Indian Reservation to the North of the mine site.

1.1 Preliminary Site Evaluation

On November 15th, 2004 a brief field reconnaissance of the site was conducted by representatives of Cedar Creek and MWH, Inc. A second reconnaissance was conducted by a Cedar Creek representative on April 29th, 2009. These reconnaissance efforts resulted in the following four preliminary determinations. First, the NECR site exists within a Piñon – Juniper (PJ) Woodland community with occasional small pockets of mixed shrubland and ruderal shrubland (around disturbance sites) at an elevation ranging between 7,000 and 7,200 feet above mean sea level. Second, the NECR site and environs exhibits evidence of extensive and detrimental grazing impacts resulting in notable damage to the herbaceous component of the understory. Range condition ranged from "poor" to "fair" and native habitats show evidence of substantial impact.

Third, the site exhibits reasonable options for selection of reference locations that are representative of site-specific (pre-mining) conditions, including the current range condition. However, it is unlikely that any area in the vicinity of the NECR mine can be found that is in "good" range condition. Furthermore, it is unlikely that any significant fencing program can be instituted to substantially improve range condition in the vicinity of the NECR mine over the next decade. However, at least one area to the west / northwest of the project area (northwest background area) was noted during the field reconnaissance that would offer a reasonable comparison target. This area exhibited substantially reduced overstory cover from tree and large shrub species thereby providing elevated values from the community's herbaceous component. This is important as reference area comparisons with revegetation would only involve this herbaceous component. If for any reason use of a reference area cannot occur, standards would be set based on best professional judgment given existing soils, NRCS productivity data, revegetation data from other mining operations in the region, and / or similar sources of information.

Fourth, a variety of plants were observed at the site, the most dominant of which are listed below. Given Cedar Creek's extensive experience with western mine reclamation at least some of these plants would likely perform well if included in a revegetation seed mix that emphasizes a livestock grazing post-mining land use (assuming revegetated areas are not overgrazed too early or too often in their life cycle). Such plants are identified in boldface. Furthermore, a few additional plants that could perform well if seeded are identified below. These taxa may grow in the area but were not observed during the preliminary site review and can be identified by an underline.

Taxa Observed on Site During Reconnaissance Efforts

Piñon Pine
Ponderosa Pine
Rubber Rabbitbrush
Big Sagebrush
Indian Ricegrass
Cheatgrass
Thickspike Wheatgrass
Sand Dropseed

One-seed Juniper
Gambel's Oak
Stansbury Cliffrose
Snakeweed
Bottlebrush Squirreltail
Western Wheatgrass
Foxtail Barley
Blue Grama

Four-wing Saltbush
Galleta

Sideoats Grama
Arizona Fescue

Given these initial evaluations, a preliminary seed mix was developed (see Table below) to provide a forum for development of a final mix suitable for revegetation of site disturbances.

Table XXX **NECR - Cedar Creek's Preliminary Seed Mix***
For Areas Targeting Grassland - (Livestock Grazing Land Use)

Grassland Mix				Recommendations					This entire mix can be drill seeded
No.	Obs. On Site	Common Name	Scientific Nomenclature	PLS / lb.**	Recommd. PLS lbs/ac	PLS / ft²	% of Seeds in Mix	Preferred Method of Seeding	Comment (Based on Site-specific Findings or Professional Judgment)
1	XX	Western wheatgrass	*Agropyron smithii*	110,000	1.50	3.8	3.8%	Drill	NRCS indicated climax species
2	XX	Alkali Sacaton	*Sporobolus airoides*	1,758,000	0.75	30.3	30.0%	Drill	NRCS indicated climax species
3	XX	Blue Grama	*Bouteloua gracilis*	825,000	0.50	9.5	9.4%	Drill	Stong component of native community
4	XX	Galleta	*Hilaria jamesii*	159,000	0.50	1.8	1.8%	Drill	Stong component of native community
5		Thickspike Wheatgrass	*Agropyron dasystachyum*	154,000	0.75	2.7	2.6%	Drill	Fair performer - Offers diversity
6	XX	Indian Ricegrass	*Oryzopsis hymenoides*	141,000	1.00	3.2	3.2%	Drill	Should do well in areas of sandy texture
7	XX	Sideoats Grama	*Bouteloua curtipendula*	191,000	1.00	4.4	4.4%	Drill	Good performer - Offers diversity
8	XX	Bottlebrush Squirreltail	*Sitanion hystrix*	192,000	0.25	1.1	1.1%	Drill	Fair performer - Offers diversity
			Subtotal		**6.25**	**56.7**	**56.3%**		
9	XX	Desert Globemallow	*Sphaeralcea ambigua*	500,000	0.75	8.6	8.5%	B-cast/Harrow	Sufficient performer for diversity
10		Palmer Penstemon	*Penstemon palmeri*	610,000	0.50	7.0	6.9%	B-cast/Harrow	Good performer - Offers diversity
11	XX	Rocky Mountain Penstemon	*Penstemon strictus*	592,000	0.25	3.4	3.4%	B-cast/Harrow	Fair performer - Offers diversity
12		Lewis Flax	*Linum lewisii*	293,000	1.00	6.7	6.7%	B-cast/Harrow	Good performer - Offers diversity
			Subtotal		**2.50**	**25.7**	**25.5%**		
13	XX	Fourwing Saltbush	*Atriplex canescens*	52,000	1.00	1.2	1.2%	Drill	NRCS indicated climax species - good forage value
14	XX	Wyoming Big Sagebrush	*Artemisia tridentata wyo.*	2,500,000	0.25	14.3	14.2%	B-cast/Harrow	Occasional performer - Offers diversity
15	XX	Cliffrose	*Purshia mexicana*	64,600	1.00	1.5	1.5%	B-cast/Harrow	Fair performer - Offers diversity
16		Winterfat	*Ceratoides lanata*	56,700	1.00	1.3	1.3%	Drill	Good performer - good forage value
			Subtotal		**3.25**	**18.3**	**18.2%**		
			Total		**12.00**	**100.8**			
Alternative species which may be used as substitutes for tertiary species or added to the overall mix for additional diversity.									
Grasses		Sand Dropseed	*Sporobolus cryptandrus*	5,298,000	0.00	0.0			
		Arizona fescue	*Festuca arizonica*	550,000	0.00	0.0			Use in moist areas only, likes 14" of precip.
	XX	New Mexico Needlegrass	*Stipa neomexicana*	70,000	0.00	0.0			
	XX	Purple three-awn	*Aristida purpurea*	250,000	0.00	0.0			
Forbs		Small Burnet	*Sanguisorba minor*	55,000	0.00	0.0			
Shrubs	XX	Rubber Rabbitbrush	*Chrysothamnus naseousus*	400,000	0.00	0.0			
		Black Sagebrush	*Artemisia nova*	907,200	0.00	0.0			
		Primary Species - Should not be substituted.							
		Secondary Species - Substitute only when seed is not available. Substitutions should be: grass for grass, forb for forb, shrub for shrub.							
		Tertiary Species - May be substituted, but recommendation is to plant as indicated.							

* The 12 lb/ac mix is designed for drill seeding of grasses. When broadcast and harrow methods are used for grasses, the rate should be increased 1.5 times. When hydroseeding methods are to be used, the rate should be doubled (2X). ** PLS = Pure Live Seed.

1.2 Primary Site Evaluation

With regard to the primary field evaluation for vegetation concerns, it is anticipated that Cedar Creek's biologists would perform a one-time effort during the summer (August / September) of 2009 at the time of the normal monsoon season (when vegetative growth is at or near its peak). All sampling will be conducted by, or under the direct supervision of Cedar Creek's Senior Range / Wildlife Ecologist, Mr. Steven R. Viert and Range Ecologist, Mr. Jesse H. Dillon. Field methodologies will follow previously approved protocols that are described in further detail in Section 2.0 below.

2.0 PROPOSED SAMPLING METHODS FOR VEGETATION

The vegetation evaluations described below are designed to describe existing vegetation conditions adjacent to disturbed areas prior to mine closure and to facilitate an evaluation of the revegetation potential of the site. Additional goals of these evaluations are to aid development of revegetation recommendations as necessary, and to identify methodologies and standards by which revegetation success will be evaluated.

2.1 Sample Layout

The sample layout protocol for the 2009 site characterization evaluations will be a procedure designed to account for the heterogeneous expression of the multiple characteristics and physiognomic features within the various undisturbed target areas while precluding bias in the sample site selection process (Figure 1). By design, the procedure is initiated randomly, and thereafter, samples are located in a systematic manner, e.g., at grid coordinates spaced at consistent intervals for each sampled area. In this manner, "representation" from across the entire unit is "forced" rather than risking that significant pockets are entirely missed, or overemphasized as often occurs with other sample distribution techniques such as "Simple Random Sampling". Any reference area sampling will occur in an identical manner, although grid dimensions would be reduced accordingly. Once in the field, potential samples found to be on a disturbed area (i.e., ruderal vegetation) would be skipped.

The procedure for sample location within either target unit (vegetation community) or reference area will be as follows. First, a fixed point of reference that can be relocated from year to year (such as a fence corner or GPS coordinate) will be selected for each target sampling area. Second, depending on the size of the target sampling unit or reference area, a computer generated systematic grid of appropriate dimensions (e.g., 400 ft X 400 ft) will be selected to provide sufficient coordinate intersections to be used for sample sites. This typically results in a minimum of 20 and maximum of 50 sites, depending on the perceived variability of the target area. Reference areas would use smaller grid dimensions and the minimum number of coordinate intersections would be 15. If an insufficient number of potential sample sites is provided by the initial grid system, an "intergrid" would be utilized for additional samples. Third, scaled representations of the selected grids will be overlain on field maps of the area utilizing an orientation that can be easily established in the field (e.g., along cardinal compass points). Where necessary, this overlain grid will facilitate identification of "field markers" to allow occasional corrections if necessary, and to facilitate analyses of the total number of potential sample sites. Initial placement of the grid will be controlled by the fourth step, selection of random numbers for

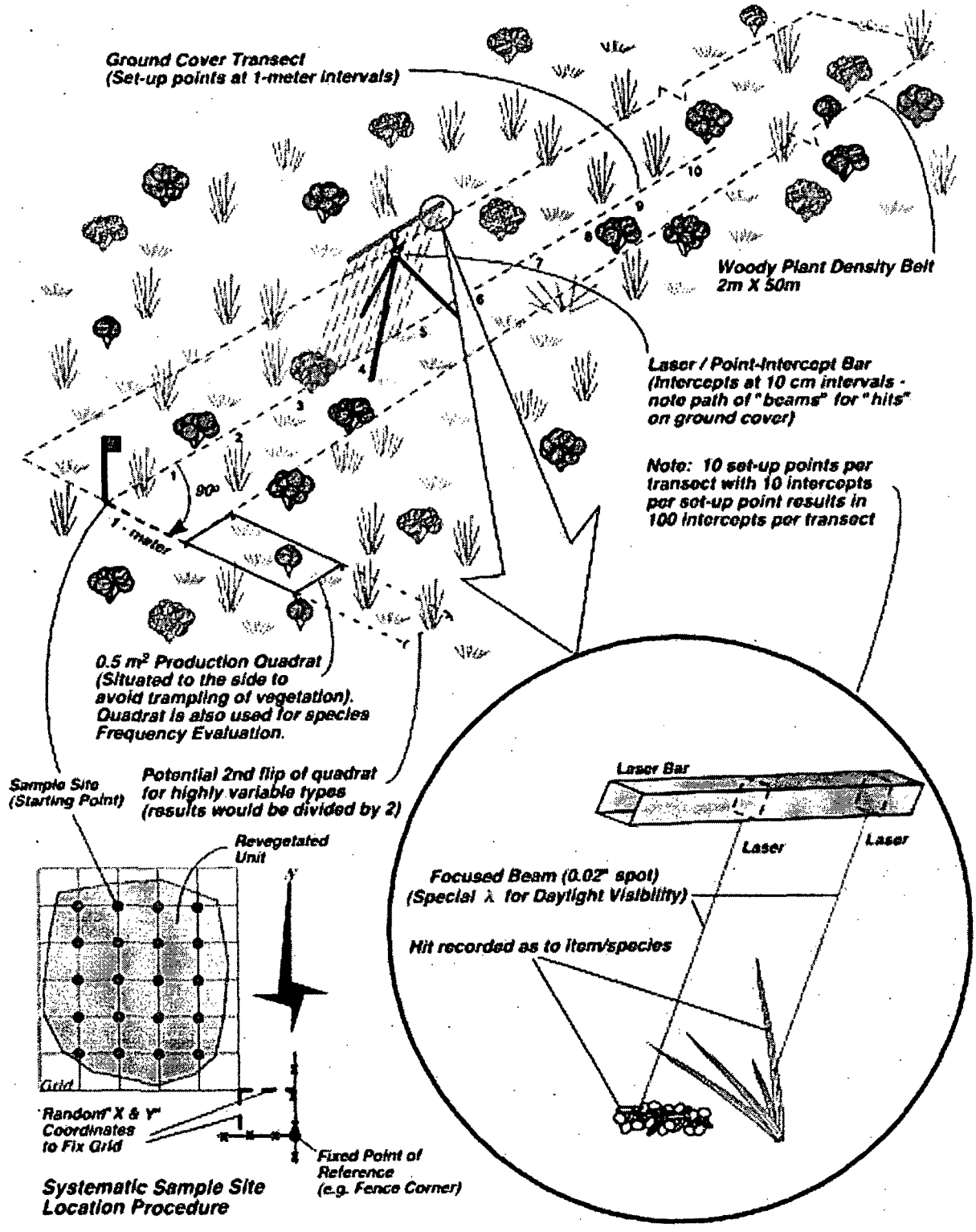


Figure 1

Sampling Procedure at a Systematic Sample Site Location

each area to allow location of the initial coordinate point. These random coordinates will be presented on eventual project mapping as appropriate. Fifth, where an excess number of potential sample points may be indicated by overlain maps, the excess will be randomly chosen (in the office) for elimination, unless it is later determined they are necessary for meeting sampling adequacy for a given variable. In this latter case, points will be added back in reverse order until sufficient samples points become available. Sixth, utilizing a hand held surveying compass, GPS, and/or hip-chain all sample points will be located in the field and flagged (if necessary) at the time of sampling. The location of all sample sites to be utilized for the 2009 sampling effort will be indicated on final project mapping.

Once a selected grid point is located in the field, sampling metrics will always be oriented in the direction of the next site to be physically sampled to further limit any potential bias. Orientation of the various sampling protocols will follow that which is indicated on Figure 1. Depending on logistics, timing, and access points to a sampling unit or reference area, the field crew will occasionally establish a set of points along coordinates in one direction and then sample them in reverse order. However, orientation protocol will always be maintained i.e. in the direction of the next point to be physically sampled. If the boundary of an area is encountered before reaching the full length of a transect, the orientation of the transect will be turned 90^{o} in the appropriate direction until the transect is completed. In this manner, transects near the edge of a unit will be retained within the correct unit by "bouncing" off the boundaries.

2.2 Sample Adequacy Determination

This scope-of-work details the collection of data regarding four principal vegetation variables: ground cover, production, woody plant density, and diversity. Of these four variables, ground cover is by far the most valuable with regard to utility of information developed (see Appendix A). Furthermore, diversity information (composition) can be developed from the ground cover data set using a simple transformation. Because of the importance of ground cover data and the fact that a second variable is developed from this data, it is important that the data set be of sufficient size (statistically adequate) to support any inferences, hypotheses, or testing. To the contrary, production and woody plant density data do not necessarily need to be determined with a statistically adequate sample as post-mining revegetation testing involving these two variables will likely utilize the reverse-null hypothesis test. This test does not require a statistically adequate sample; simply sufficient samples to reduce the variance as much as is practical (typically 30 samples). It is preferred to not use this test unnecessarily (e.g., for ground cover) because it inherently "increases the success standard" by a small amount. However, given the difficulties and cost associated with obtaining an adequate sample for production, and especially for woody plant density, the reverse-null testing procedure has significant utility. Therefore, the following discussion details how sampling adequacy will be determined for the variable of ground cover only.

In this regard, sampling within each community type will be conducted to a minimum of 30 samples for ground cover (or 15 samples in reference areas). As is typical for the science, sample means and standard deviations for total non-stratified vegetation ground cover (exclusive of litter) will be the parameters utilized for calculations. These parameters will be calculated in the field to insure collection of an adequate sample and once again by computer during final data analyses for each separate community type, or reference area. Sampling will continue until an adequate sample has been collected in accordance with the Cochran formula for determining sample adequacy, n_{min}, or until a maximum of 50 samples has been collected. The Cochran formula is utilized as it is the formula proposed for use by New Mexico's mining regulatory guidelines. The Cochran formula is as follows:

$$n_{min} = (t^2 s^2) / (0.1\bar{x})^2$$

Where: n = the number of actual samples collected with a minimum of 15 or 30 in each area;

t = the "one tailed" value from the t distribution for ∂=0.1 with n-1 degrees of freedom;

s^2 = the variance of the estimate as calculated from the initial/current samples;

$\bar{x}$ = the mean of the estimate as calculated from the initial/current samples.

To facilitate collection of a usable data set for production and woody plant density, one sample for each of these variables will be co-located with each ground cover transects as indicated on Figure 1. This will result in a total of at least 30 samples each for production and woody plant density. This level of information should be more than sufficient to adequately characterize the target community with regard to these variables.

2.3 Statistical Testing

Following field evaluations, the selected reference area will be compared with the remaining "baseline" area (undisturbed adjacent community) to provide an indication of its suitability for revegetation success determination. This testing will involve the commonly accepted statistical student's "t-test" of the means for ground cover sampling from each of the two areas at the level of significance of α = 0.1 with 90% confidence. For production and woody plant density, testing may involve a "reverse-null" hypothesis testing procedure, either against reference area data or a proposed standard. (Diversity testing will likely be a direct mathematical comparison against set standards such as 3 perennial grasses, 1 forb, and 1 shrub contributing more than 1% of the composition.) Because the "reverse-null" hypothesis test is not a commonly understood test, the following paragraphs have been provided to more fully explain this process.

For this procedure, collection of an "adequate" sample (where $\mathbf{n_{min} \leq n}$) is not necessary as it is in the operator's best interest to sample until a "tight" estimate of the mean is obtained (i.e., sampling should continue until the variance is more "narrowly" defined). Typically, a sample size of 30 or greater provides such an estimate (due to the Central Limit Theorem). In the "classical" null hypothesis test, rejection of H_o means failure as the hypothesis being tested is that the target area variable is greater than or equal to 90% of the reference area or standard. However, in the reverse null test, rejection of H_o means success as the hypothesis being tested is that the target area variable is less than or equal to 90% of the reference area or standard. Therefore, once a sample has been collected from both the target area of interest and the reference area (or standard), the means and variances ($\bar{x}$ and s^2) of those samples will be utilized for testing success or failure as follows:

For two-sample testing (with a reference area) for assumed equal variances, the following test would be performed:

$$t_c = \frac{\bar{x}_{rv} - 0.9\bar{x}_{ra}}{\sqrt{s_p^2\left(\frac{1}{n_{rv}} + \frac{1}{n_{ra}}\right)}} \quad \text{Where the pooled variance } s_p^2 =$$

$$s_p^2 = \frac{\left[(n_{ra} - 1)0.81s_{ra}^2 + (n_{rv} - 1)s_{rv}^2\right]}{(n_{ra} + n_{rv}) - 2}$$

Then if $t_c > t$ for $t_{(\alpha=0.1,\ nra+nrv-2\ d.f.)}$ the test is successful.

For two-sample testing (with a reference area) for assumed unequal variances, the following test would be performed

$$t_c = \frac{\bar{x}_{rv} - 0.9\bar{x}_{ra}}{\sqrt{w_{rv} - w_{ra}}} \quad \text{Where } w_{ra} = \frac{0.81s_{ra}^2}{n_{ra}} \text{ and } w_{rv} = \frac{s_{rv}^2}{n_{rv}}$$

and the degrees of freedom are approximated by :

$$\frac{(w_{ra} + w_{rv})^2}{\frac{w_{ra}^2}{n_{ra} - 1} + \frac{w_{rv}^2}{n_{rv} - 1}}$$

Then if $t_c > t$ for $t_{(\alpha=0.1,\ \text{approx. d.f.})}$ the test is successful.

For one-sample testing (against a standard), the following test would be performed:

$$t_c = \frac{\bar{x}_{rv} - 0.9Q}{s/\sqrt{n}}$$

Where: Q = the standard (e.g. 200 woody plants per acre).

Then if $t_c > t$ for $t_{(\alpha=0.1,\ n-1\ \text{d.f.})}$ the test is successful.

2.4 Determination of Ground Cover

Ground cover at each sample point will be determined utilizing the point-intercept methodology (also referred to as "line-point") as illustrated on Figure 1. As indicated in this figure, Cedar Creek utilizes state-of-the-art laser instrumentation to facilitate much more rapid and accurate collection of data. A transect of 10 meters length will be extended in the direction of the next sampling location from the flagged center of each systematically located sample point. At each one-meter interval along the transect, a "laser point bar" will be situated vertically above the ground surface, and a set of 10 readings recorded as to hits on vegetation (by species), litter, rock (>2mm), or bare soil. Hits will be determined at each meter interval by activating a battery of 10 specialized lasers situated along the bar at 10 centimeter intervals and recording the variable intercepted by each of the narrow (0.02"), tightly focused beams (see Figure 1). In this manner, a total of 100 intercepts per transect will be recorded resulting in 1 percent cover per intercept. Each transect serves as one data point (i.e. n = 1). This methodology and instrumentation facilitates the collection of the most unbiased, repeatable, and precise ground cover data possible.

2.5 Determination of Current Annual Production

The post-mining land use is domestic livestock grazing, and will not be changed from this proposal. Therefore, the following procedure for collection of current annual production is proposed. In no case however, would production exclosures be utilized; visual estimations of production and utilization would be substituted.

Procedure

At each ground cover sample site, current annual herbaceous production will be collected from a 0.5 m^2 quadrat frame placed one meter and 90° to the right (clockwise) of the ground cover transect to allow avoidance of vegetation trampled by investigators during sample site location. From within each quadrat, all above ground current annual herbaceous plant growth within the vertical boundaries of the frame will be clipped and bagged separately by life form or origin as follows:

Native Perennial Grass/Sedge
Introduced Perennial Grass
Introduced & Native Annual Grasses
Sub-Shrubs
Native Perennial Forbs
Introduced Perennial Forbs
Introduced & Native Annual & Biennial Forbs
Listed Noxious Weeds

Once in the field, biologists will evaluate field conditions at NECR and may modify procedures slightly. Such modifications would involve quadrat size and would be manifested by subsequent flips of the quadrat frame as indicated on Figure 1. Such activity would only occur in an effort to collect a less variable sample. Given the preliminary site visit to NECR it is anticipated that actual quadrat shape for this site will be 0.5 m x 4 m (or 2 m^2) or the equivalent of 4 flips of the frame. Use of such a long quadrat in low production areas such as PJ woodland has better potential to reduce sample variance than other techniques. In either case, once a quadrat size is selected for a given area or reference area, it will be consistently maintained until sampling is completed.

All production samples will be returned to the lab for drying and weighing. Drying will occur at 105° C until a stable weight is achieved (usually after 24 hours). Samples will then be re-weighed to the nearest 0.1 gram.

2.6 Determination of Woody Plant Density

Woody plant density will be determined for sampled areas in 2009 using density belts. A 2-meter wide by 50 meter long belt transect will be established at each ground cover sample site and extended in the direction of the next sampling point (typically along a cardinal compass direction – see Figure 1). The procedure will be implemented by slowly progressing along the centerline of the belt and recording woody plants by species rooted within one-meter on either side of the centerline. Each plant counted in this manner translates to 40.5 plants per acre.

If the selected reference area is insufficiently large to readily accept 2m x 50m belts (i.e., belts may cross which would then violate statistical sampling assumptions), an alternate procedure would be

utilized. In this regard a total population count of the reference area would occur. The procedure to be utilized in this circumstance would be implemented as follows. First, the external perimeter of the reference area would be delineated using hip-chain thread. Second, the entire area would be subdivided into long readily observable strips approximately 20 feet in width for each available observer, again using hip-chain thread. Finally, a line of observers would systematically sweep each strip within the reference area counting each segregate woody plant by species. Constant communication between observers precludes double counting or missing of "strip boundary" plants.

In certain areas with a Piñon / Juniper overstory, a similar total count of trees may also occur. Depending on the total acreage of such area, this may involve a total count of the entire acreage (most likely) or an alternate procedure of macro-plot counts. In this latter case the area would be divided into one-acre increments and a selected number of these "macro-plots" would be totally enumerated thereby providing a mathematical basis for a determination of the entire population (e.g. if 40% of the acreage were totally counted, then the resulting density numbers would be divided by 0.4 to provide a reliable estimate of the entire population).

Attachment 7

EPA Emergency Response Section (ERS) and Superfund Technical Assessment and Response Team (START)

Time-Critical Quality Assurance Sampling Plan For Radiation Assessment of Unregulated Drinking Water Sources

Response Location: Navajo Nation Water Well Sampling / NECR Water Well Sampling,
TDD#: T02-09-10-08-0004 / T02-09-10-08-0005

Date: October 8, 2010

Prepared by: Mike Folan _____ Date:

Reviewed by: Howard Edwards, Ecology and Environment, Inc. Date:

Andrew Bain, U.S. EPA Date:

Cynthia Wetmore, U.S. EPA Date:

Linda Reeves, U.S. EPA Date:

_____,NNEPA Date:

Approved by: Harry L. Allen, U.S. EPA _____ Date:

This sampling plan was prepared and delivered to the EPA Task Monitor:

☒ **Prior to Sampling** ☐ **Post Sampling (within one month of sampling)**

This emergency sampling plan is intended to be used in conjunction with the EPA's Region 9 Emergency Response Section's Generic Data Quality Objectives (DQOs) for Time-Critical Evaluations. This sampling plan has been designed to assist field responders in their preparation for collecting, analyzing, shipping, storing and handling samples collected during a time-critical response. The use of this generic sampling plan will involve forethought and planning that should help direct the sampling and analytical work. It is meant to be used in the case of emergency responses or time-critical responses when sampling teams may not have the opportunity to write a more thorough sampling plan. Sampling teams should always reference standard quality procedures, standard operations procedures, standard methods for sampling and analytical guidance.

The development of this generic plan will improve the documentation, communication, planning, and overall quality associated with the sampling and analysis by:

1) encouraging field teams to consider their goals and objectives before the generation of environmental data,
2) documenting predetermined information in a standardize format,
3) increasing the communication between sampling personnel and decision makers, and
4) detailing expectations and objective before samples are collected.

1.0 Introduction and Background. ***Describe the site and specify the geographic boundaries for the site and any specific areas of concern. What is the problem, what precipitated the response, which agencies and other entities (e.g., contractors) are on site, who has taken the lead for the response and for environmental clean-up actions?***

Many households on the Navajo Reservation obtain their water from wells that were drilled or dug without previously obtaining permits and that do not conform to ordinary practices for well completion. The wells are often used for a combination of residential, domestic or agricultural purposes. Some households use surface water sources, rather than groundwater, that are also of poor quality. Nearly all of these water sources are used or consumed without treatment. USEPA Region 9 and the Navajo Nation EPA need to obtain good information about contaminants, in particular radioactive contaminants, in these water sources, using the National Primary Drinking Water Regulations (NPDWR) Maximum Contaminant Levels (MCLs) For Drinking Water that are listed in 40CFR141 Subpart G, and most notably in 40CFR141.66, as benchmarks for water quality.

The USEPA has agreed to conduct well sampling as a one-time event. Sampling will be performed under two separate projects: (1) Navajo Nation Well Sampling and (2) Northeast Church Rock Water Well Sampling. Where a determination is made that a significant imminent threat exists, the data will be evaluated to identify sources that exceed federal primary and secondary maximum contaminant levels to determine next steps. The information will be given to those responsible for the operation of the water sources and residents using the sources on a case-by-case basis, as deemed appropriate by the Navajo Nation EPA. The USEPA will be responsible for the analysis of metals, radioactive parameters and additional water parameters.

One area of focus in the October 2010 sampling event will be approximately 10 wells within the Eastern Agency that were sampled in 2008 but require confirmation samples for data validation. This will be referred to as the Navajo Nation Well Sampling project.

The Centers of Disease Control (CDC) and USEPA sampled a total of 199 water sources during 2006/2007 and 2008 respectively, from non-municipal water sources within the Navajo Nation. A significant portion of the water sources were found to contain metals and/or radioactive parameter analytes which exceeded site-specific action levels determined by the USEPA including 22 water sources which exceeded primary drinking water standards for radionuclide's.

The other area of focus in the October 2010 sampling event will be approximately 7 wells in the vicinity of the Northeast Church Rock Mine near Gallup, NM. This project will look at the impact of Northeast Church Rock Mine on residential wells in that specific area. This project will be referred to as the Northeast Church Rock Water Well Sampling project.

The START and a commercial laboratory will assist with this investigation. The USEPA's States, Tribes, and Site Assessment Section is the lead USEPA section for the assessment. After the assessment data is collected, the EPA's Emergency Response Section will evaluate the data to determine whether there is an imminent and substantial threat to human health which could prompt further actions by the EPA under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) authority.

Ref: United States Army Corps of Engineers, IAG No. DW96955370-01-0, Data Quality Assurance Summary, Section 2, Field Operation Summary, Revision 3, December 2000

2.0 Objectives. *Brief statement on the general project objective. What is the overall goal or objective? Specific objectives are summarized in Table D in Section 3.5.*

The primary objective of this assessment is to verify previous analytical data and determine whether unregulated drinking water sources are contaminated above MCLs for the analytes investigated.

2.1 Data Use Objectives. (How will the data be used?)

Radiation Monitoring Data
Data from direct-reading instruments will be used:

1) ☐ To be compared with established background radiation data.
2) ☐ To compare with site-specific action levels or risk-based action levels to determine if acute or chronic health threats exist.
3) ☐ To assist with determining the area of impact due to a release.
4) ☐ To assist with determining whether radioactive materials have contaminated specific areas or movable objects.
5) ☐ To assist in the identification of the potential source of radiation.
6) ☐ Other objectives:

Data from Collected Sample
Analytical data for soil, water, air or other media samples, if generated, will be used:

7) ☒ To be compared with site-specific action levels or risk-based action levels (e.g., EPA MCLs) to assist in determination if health threats exist.
8) ☒ Other objectives: Provide Navajo agencies and public with information regarding quality of unregulated water sources that residents, against the advice of Navajo Nation EPA, use for potable water.

2.2 Objectives. (What are you proposing to do?)

Radiation Measurement
1) ☐ Measurement to establish the presence or absence of radiation above site-specific action levels or risk-based action levels in the area of concern. (Initial assessment and post removal confirmation).
- ☐ Airborne
  - ☐ Static
    - ☐ Activity
    - ☐ Dose Rate
    - ☐ Dose
  - ☐ Scanning
    - ☐ Activity
    - ☐ Dose Rate
- ☐ Surface
  - ☐ Static
    - ☐ Activity
    - ☐ Dose Rate
    - ☐ Dose
  - ☐ Scanning
    - ☐ Activity
    - ☐ Dose Rate

2) ☐ Measurement to determine the location of contamination within the area of concern.
- ☐ Airborne (area)
- ☐ Surface

3) ☐ Activity screening to establish control points (exclusion, decontamination and support zones).
- ☐ Airborne
  - ☐ Static
  - ☐ Scanning
- ☐ Surface
  - ☐ Static
  - ☐ Scanning

4) ☐ Activity screening to determine type of radiation.
- ☐ Airborne
  - ☐ Static
  - ☐ Scanning
- ☐ Surface
  - ☐ Static
  - ☐ Scanning

5) ☐ Other:

Sample Screening

6) ☐ Activity screening of samples for evaluation prior to definitive analysis.

7) ☐ Other:

Sampling

8) ☐ Surface soil sampling to estimate the lateral extent of contamination
- ☐ Over specific source area(s) or areas of concern
- ☐ Over the entire site
- ☐ Off-site

9) ☐ Subsurface soil sampling to estimate the vertical extent of contamination
- ☐ Over specific source area(s) or areas of concern
- ☐ Over the entire site
- ☐ Off-site

10) ☐ Air sampling to estimate airborne extent of contamination
- ☐ Over specific source area(s) or areas of concern
- ☐ Over the entire site
- ☐ Off-site

11) ☐ Wipe sampling to estimate removable extent of contamination
- ☐ Over specific source area(s) or areas of concern
- ☐ Over the entire site

☐ Off-site

12) ☐ Groundwater sampling to estimate extent of contamination
- ☐ Over specific source area(s) or areas of concern
- ☐ Over the entire site
- ☐ Off-site

13) ☐ Surface water sampling to estimate extent of contamination
- ☐ Over specific source area(s) or areas of concern
- ☐ Over the entire site
- ☐ Off-site

14) ☐ In-situ surface sampling to estimate extent of contamination
- ☐ Over specific source area(s) or areas of concern
- ☐ Over the entire site
- ☐ Off-site

15) ☐ In-situ airborne sampling to estimate extent of contamination
- ☐ Over specific source area(s) or areas of concern
- ☐ Over the entire site
- ☐ Off-site

16) ☐ Other:

2.3 Matrices

- ☐ Airborne (area) Monitoring
- ☐ In-situ measurement
  - ☐ Surface soil
  - ☐ Subsurface soil
  - ☐ Other (specify): floor, wall, and ceiling surface dose rate, area dose rate, and floor activity
- ☐ Surface soil
- ☐ Sub-surface soil
  Depth(s):
- ☐ Wipe (removable contamination)
- ☐ Radon-222
- ☐ Particulates in air
- ☒ Water
  - : Surface water
  - : Groundwater
  - : Tanks or other containers
  - ☐ Wastewater
- ☐ Containerized waste
  - ☐ Solid
  - ☐ Liquid
- ☐ Other:

2.4 Data Type

In general, data type and data needs should be decided prior to data generation. The data can be generally divided into three categories: definitive methodology data (referred to as definitive data for brevity and generally generated using standardize methods), non-definitive methodology data (also referred to as screening data) and screening data with at least 10% definitive data confirmation (referred to as collaborative data). The generation of definitive data is preferable, however in emergency and time critical situations where definitive data is not available, non-definitive data should be generated. Note that the data type is not an indicator of precision, accuracy or documentation of completeness or quality! Reported data should be verified (by a party other than the laboratory) as meeting specific quality control and data category requirements by following a verification or validation procedure. Refer to the START or ERS Quality Assurance Plans for specific quality parameters and requirements.

Check appropriate box(es):

For radiation monitoring data generated during the assessment and removal,

☐ Time-Critical Screening Quality Data will be generated The data by itself may not be verifiable. The data will be reported for evaluation to make a decisions.

For sampling data generated during the assessment and removal,

1 ☐ **Time-Critical Screening Quality Data** will be generated. The data by itself may not be verifiable. **Due to the time critical situation, the data must be reported and may be used to make decisions.**

2a ☐ **Time-Critical Collaborative Data** will be generated (screening data with at least 10 percent definitive data). Data using non-definitive analytical methodologies will be generated. **Due to the time critical situation, the data must be reported and may be used to make decisions prior to generation of definitive data.** The screening data by itself may not be verifiable. Screening data will be evaluated and reported with definitive data at a later time.

2b ☐ **Collaborative Data Sets** will be generated (screening data with 10 percent definitive data). Data using non-definitive analytical methodologies will be generated. **Data will not be reported until it is evaluated against definitive data.**

3a ☐ Time-Critical Definitive Data Sets will be generated without validation. The sampling and analysis must be done on an emergency basis. **Due to the time critical situation, the preliminarily data must be reported and used for comparison without validation. Analytical data packages will be required. However, since the data was not used or intended for decision making, validation of the data package will not be performed.** (Document generic DQO deviation in Section 4.4)

3b ☐ **Time-Critical Definitive Data Sets** will be generated with validation. The sampling must be done on an emergency basis. **Due to the time critical situation, preliminary data must be reported and may be used to make decisions without validation. The generated analytical documentation packages will be reviewed and validated. Qualified data will be reported after validation.**

3c ☒ **Definitive Data Sets** will be generated with third-party validation. **Full documentation will be required. Analytical data packages will be reviewed and validated prior to reporting.**

2.5 Contaminants of Concern

The radiation parameters of concern, proposed analytical method or Field Operating Procedure (FOP), proposed action levels and available reporting limit are summarized in Table A-1. Metals of concern are summarized in Table A-2. If other analytes of concern exist, they should be addressed in a separate QASP.

Table A-1 Radiation of Concern			
Radiation Type (check all that apply)	**Proposed Monitoring Method**	**Proposed Action Level**	**Available Reporting Limit**
☐ Alpha Particles			
☐ Beta Particles			
☐ Gamma Rays			
☐ Neutrons			
☐ Radionuclide Identification	Gamma Spectroscopy	Qualitative	Qualitative
Radionuclides of Concern			
Radionuclide (list all of concern)	**Proposed Analytical Method**	**Proposed Action Level**	**Available Reporting Limit**
☒ Gross alpha	EPA Method 900 or equivalent	15 pCi/L[(1)]	1.0 pCi/L
☒ Gross beta and photon radioactivity	EPA Method 900 or equivalent	1.0 pCi/L[(2)]	1.0 pCi/L
☒ Radium-226	EPA Method 903.1 or equivalent	5 pCi/L[(3)]	1.0 pCi/L
☒ Radium-228	EPA Method 904.0 or equivalent	5 pCi/L[(3)]	1.0 pCi/L
☒ Isotopic Uranium (233/234, 235/236, 238)	HASL 300 U-01-RC mod	1.0 pCi/L[(4)]	1.0 pCi/L

☒ Isotopic Thorium (228, 230, 232)	HASL 300 Th-01-RC mod	1.0 pCi/L	1.0 pCi/L
Other Data Collection Activity (non-radiological) *(circle all that apply)*	GPS Visual Interviews Magnetometer Other Geophysical Modeling File Search Water quality parameters [5] (pH, temperature, conductivity, DO, salinity, TDS, Turbidity, ORP) Photograph of water source		

Add additional pages if necessary.

Key:

(1) Includes radium-226 but excludes uranium and radon.

(2) The MCLG is listed at zero. In this specific case 1.0 pCi/L is the lowest available reporting limit. The MCL is stated as 4 mrem/yr for man-made radionuclides; the annual dose equivalent to the total body or any internal organ is 4 mrem/yr.

(3) Action level of 5 pCi/L is for combined radium-226 and radium-228.

(4) Method will measure specific Uranium isotope activity rates. Total Uranium MCL is 30 ug/L.

(5) Water quality parameters will be measured real time with an appropriate water quality instrument that reads all listed parameters.

Table A-2
Metals of Concern

Metal (check all that apply)	Proposed Monitoring Method	Proposed Action Level	Available Reporting Limit
☒ Target Analyte List Metals	EPA 6010 B	See Table J	See Table J
Other Data Collection Activity (non-radiological) *(circle all that apply)*	GPS Visual Interviews Magnetometer Other Geophysical Modeling Photography File Search		

3.0 Approach and Sampling Methodologies

3.1 Sampling Approach

Monitoring approach that is to be used with monitoring instruments (select approach):

1) ☐ Due to the lack of site information the approach will be determined in the field based on professional judgment of START.

2) ☐ Due to the lack of site information the approach will be determined in the field based on professional judgment of USEPA.

3) ☐ Due to the lack of site information the approach will be determined in the field based on professional judgment of local regulator.

4) ☐ Judgmental (Biased)

5) ☐ Random

6) ☐ Systematic- Non Search

7) ☐ Transects

8) ☐ Search-Grid (Systematic planning using tools like Visual Sample Plan or DQO-PRO)

If a search-grid, specify grid type (circle one): Not Applicable Square Triangle Rectangle

Size of contamination hot-spot to be detected:

Shape of hot-spot (circle one): Circle Elliptical Elongated-Elliptical

Required Grid Spacing:

Acceptable probability of missing hot-spot (circle one): 5 % 10 % 20% 40%

9 ☐ MARSSIM Final Status Survey (Documented in an attached document)

Sampling approach that is to be used to select samples (select approach):

1 ☐ High biased with radiation sampling instruments

2 ☐ Low biased with radiation sampling instruments

3 ☐ Random

4 ☐ Systematic-- Non Search

5 ☐ Transects

6 ☐ Search-Grid

7 ☒ Judgmental (Biased): Wells will be sampled for the NECR well project based on the vicinity to the NECR mine. Wells will be sampled for the Navajo Nation well project based data gaps from the previous investigations. Wells for both projects have been selected due to their use as community drinking water sources.

If a search-grid, specify grid type (circle one): Not applicable Square Triangle Rectangle

Indicate the size of contamination hot-spot to be detected:

Indicate the shape of hot-spot (circle one): Circle Elliptical Elongated-Elliptica

Indicate the required Grid Spacing:

Indicate the acceptable probability of missing hot-spot (circle one):

5 % 10 % 20% 40%

7 ☐ MARSSIM Final Status Survey (Documented in an attached document)

3.2 Field Analysis Equipment

Field analysis equipment requirements are summarized in Table B-1 .

Table B-1
Field Analytical Equipment

Monitoring Equipment Specify the radiation monitoring instrument to be used. Select the appropriate boxes.	**Meter range**	**Probe**	**Amount**	**Resource/Contractor**
☐ Ludlum Model 19 Micro R Meter, (Gamma)	0-5000 µR/hour	Integrated with Meter		
☐ Ludlum Model 3-97 (Gamma)	0-3000 µR/hour	Integrated with Meter		
☐ Ludlum Model 44-38 Beta and Gamma	0-3000 µR/hour 0-200 µR/hour	Integrated with Meter. ☐ External gamma/beta energy compensating Geiger-Mueller		
☐ Ludlum Model 2241-2 Ratemeter	0.0 cpm- 999 kcpm or 0.1-999 µR/hour	☐ Pancake Probe Ludlum Model 44-9 ☐ Alpha Scintillatior Ludlum Model 43-90 ☐ Beta Scintillatior Ludlum Model 44-116 ☐ Gamma Ludlum Model 44-10 ☐ Gamma Ludlum Model 44-20		
☐ Ludlum Model 2221 Ratemeter/Scaler		☐ Alpha Scintillatior Ludlum Model 43-90 ☐ Beta Scintillatior Ludlum Model 44-116 ☐ Gamma Ludlum Model 44-10		
☐ Ludlum Model 192 Micro R Meter (Gamma)	0-5000 µR/hour	Integrated with Meter		
☐ Bicron Surveyor M Ratemeter	0 cpm- 1,000 kcpm	☐ Pancake Probe PGM ☐ Scintillatior G1		
☐ BNC SAM 935 Gamma Spectrometer	0.01-99 µR/hour	Spectrometer Integrated with Meter		
☐ Eberline RO20 Ion Chamber (Beta and Gamma)	0-50 R/hour	Integrated with Meter		
☐ Bicron Model 2221 Portable Scaler Ratemeter	50-5000k cpm	☐ Gamma Ludlum Model 44-10 ☐ Alpha Scintillator Ludlum Model 43-90 ☐ Beta Ludlum Model 44-116		
☐ SAIC Exploranium GR-130 mini-SPEC (gamma spectrometer	0- 65,535 cps 1 µR/hour-5mR/hour	Spectrometer Integrated with Meter		

☐ Canberra AN/UDR-14 Mini-Radiac Monitor (gamma dosimeter)		Integrated with dosimeter		
☐ Ludlum Model 15 (gamma, beta, neutrons)		☐ Neutrons Ludlum Model 42-9BF ☐ Gamma/beta Ludlum Model 44-7		
☐ Ludlum Model 3030 (alpha/beta counter)				
☐ Ludlum Model 78 Stretch Scope (gamma)				
☐ Ludlum Model 239-1F Floor Monitor (alpha and beta)				
☐ Other:				
☐ Other:				
☐ Other:				

Non Radiation Detection Analytical Equipment

Monitoring Equipment Specify the Non-radiation monitoring instrument to be used. Select the appropriate boxes.	**Make**	**Model**	**Amount**	**Resource/Contractor**
☐ X-Ray Fluorescence (XRF) Device [for metals]	Innov-X			
☐ X-Ray Fluorescence (XRF) Device [for metals]	☐ Metals			
☒ Other: Water quality meter	YSI	To be determined		U.S. EPA
☒ Other: Water level meter	Solinst	To be determined		U.S. EPA
☐ Other:				
☐ Other:				

Check Standard for Analytical Instruments

STANDARD	**Type**	**Model**	**Amount**	**Resource/Contractor**
☐ Metals	NIST	SRM 2709 SRM 2710 SRM 2711 Silicon Dioxide Blank		
☐ Metals	EPA QATS			

☐ Alpha radioisotope Check Source				
☐ Beta radioisotope Check Source				
☐ Gamma radioisotope Check Source	Cs-137			
☐ Other:				
☐ Other:				

3.3 Field Sampling Equipment

Field equipment requirements are summarized in Table B-2.

Table B-2
Field Sampling and Decontamination Equipment

Analyses and Matrix	Sampling Equipment	Dedicated or Reusable	Decontamination Solution	Resource/ Contractor
All	Pre-existing monitoring well pump	N/A	Not required	Not Applicable
All	Polypropylene bailer with filament line, or 500 ml-1 L polypropylene sampling container	Dedicated	Not required	START

3.4 Field Methods and Procedures

3.4.1 Sample/Measurement Locations.

Sample locations and location name are summarized in Attachment A. Seven wells will be sampled in the NECR mine region with one duplicate sample to be selected at random in the field depending on the ease of sample collection. Additionally, ten wells will be sampled at specific locations in the Eastern Agency of the Navajo Nation with one duplicate sample to be selected at random in the field depending on the ease of sample collection. Due to drought conditions, seasonal weather activity and/or access issues, some sources may not be able to be sampled.

Water sample access points are expected to be variable in type. Some may have pumps (wind-, electric-, or hand-powered), some may have taps (spigots), and some may need to be bailed. The preferred sampling method at each groundwater sampling location will be to collect the water in the same manner that the typical water source user obtains the water. Therefore, water sources will not be purged prior to sampling. When feasible, water temperature, pH, dissolved oxygen, conductivity, oxidation reduction potential, salinity, turbidity and total dissolved solids readings will be obtained at the sampling location. Due to the season and high elevations of some of the sampling locations, some water sampling locations may be iced over. If no liquid water component can be obtained (e.g., by breaking away covering ice), the sample cannot be collected.

Background Measurements

Background samples are not required since attribution is not within the scope of the assessment.

Groundwater Sampling

Groundwater samples will be collected in accordance with the EPA's Emergency Response Team (ERT) standard operating procedure (SOP) number 2007, Groundwater Well Sampling. If possible, the depth from the top of the well casing to the water level will be measured in accordance with ERT's SOP number 2043, Manual Water Level Measurements. These SOPs will be followed if appropriate and possible. Each location will be assessed to determine the most appropriate method to collect a representative sample. The method of sample collection will be documented in the field logbook.

Surface Water Sampling

Surface water samples will be collected in accordance with ERT's SOP number 2013, Surface Water Sampling. Each location will be assessed to determine the most appropriate method to collect a representative sample. The method of sample collection will be documented in the field logbook.

Container Sampling

Container samples will be collected in accordance with ERT's SOP number 2010, Tank Sampling. Each location will be assessed to determine the most appropriate method to collect a representative sample. The method of sample collection will be documented in the field logbook.

3.4.2 Sample Labeling and Documentation

Sample Jar Labels

Sample labels will clearly identify the particular sample and should include the following:

1. Site name
2. Time and date samples were taken
3. Sample preservation
4. Analysis requested
5. Sample location and/or identification number

Sample labels will be securely affixed to the sample container.

Chain of Custody Record

A chain of custody record will be maintained from the time the sample is taken to its final deposition. Every transfer of custody must be noted and signed for, and a copy of this record kept by each individual who has signed. When samples (or groups of samples) are not under direct control of the individual responsible for them, they must be stored in a secured container sealed with a custody seal.
The chain of custody record should include (at minimum) the following:

1. Sample identification number
2. Sample information
3. Sample location
4. Sample date and time
5. Names(s) and signature(s) of sampler(s)
6. Signature(s) of any individual(s) with control over samples

Custody Seals

Custody seals demonstrate that a sample container has not been tampered with or opened. The individual in possession of the sample(s) will sign and date the seal, affixing it in such a manner that the container cannot be opened without breaking the seal. The name of this individual, along with a description of the samples packaging, should be noted in the field book.

All sample documents will be completed legibly in ink. Any corrections or revisions will be made by lining through the incorrect entry and by initialing the error. These include the logbooks, the chain of custody forms, this field QASP and any other tracking forms.

Field Logbook

The field logbook is essentially a descriptive notebook detailing site activities and observations so that an accurate account of field procedures can be reconstructed in the writer's absence. All entries will be dated and signed by the individuals making the entries and will include the following:

1. Site name and project number
2. Names of sampling personnel
3. Dates and times of all entries (military time preferred)
4. Descriptions of all site activities, especially sampling start and ending times. Include site entry and exit times
5. Noteworthy events and discussions
6. Weather conditions
7. Site observations
8. Identification and description of samples, sampling method, and locations
9. Conditions that may influence radiation measurements (objects, geometry, source material)
10. Subcontractor information and names of on-site personnel
11. Date and time of sample collections, along with chain of custody information
12. Record of photographs
13. Site sketches
14. Exact times of various activities and occurrences related to sampling
15. Deviations from standard procedures or methods and the rational for the deviations.

An electronic database will be generated for this projected that includes information listed above combined with validated data.

3.4.3 Sample Containers and Preservatives

Containers and preservatives are summarized in Table C.

3.5 Analytical Methods and Procedures

The analytical methods per sample and sample location are presented in Table D. General field QC considerations and requirements are presented in Table E.

Table C
Containers and Preservatives
Water Samples

Analyses	Laboratory	Container Type (per sample)	Preservation Method	Holding Time
Gross alpha/beta, EPA Method 900.0	GEL Laboratories	Three 1-liter HDPE (A total of 4 liters for MS/MSD sample)	pH<2.0 HNO_3 4 ± 2 degrees Celsius	180 days
Ra-226/228, EPA Method 903.1/904.0			pH<2.0 HNO_3 4 ± 2 degrees Celsius	180 days
TAL Metals EPA Method 9310	GEL Laboratories	One 500-ml HDPE (1000 ml for MS/MSD)	pH < 2.0 HNO_3 4 ± 2 degrees Celsius	180 days 14 days mercury
Nitrate/Nitrite, EPA 300.0 Ortho Phosphate EPA 300.0	GEL Laboratories	One 500-ml HDPE (No additional volume required for QC)	4 ± 2 degrees Celsius	48 hours
Chloride EPA 300.0 Fluoride EPA 300.0 Sulfate EPA 300.0			4 ± 2 degrees Celsius	28 days
Isotopic Thorium (238, 230, 232) (HASL 300 Th-01-RC-mod)	GEL Laboratories	One 1-Liter HDPE	pH < 2.0 HNO_3 4 ± 2 degrees Celsius	180 days
Isotopic Uranium (233/234, 235/236, 238) (HASL 300 U-02-RC mod)	GEL Laboratories	One 1-Liter HDPE	pH < 2.0 HNO_3 4 ± 2 degrees Celsius	180 days
2H/1H and 18O/16O analysis of water	Isotech Laboratories	One 125 ml HDPE	4 ± 2 degrees Celsius	180 days

Table D
Sample Locations and Data Objective Summary

Sampling Locations and Identifiers should correspond to location indicated on Figure A

Sample Locations	Sample Identifiers	Analytical Method Refer to Table A-1 and/or A-2	Data Use Objective(s) Refer to Section 2.1	Data Category Refer to Section 2.4	Samples & Matrix
All	The following code will be used for identifiers: W-#####-# W = Well #####=well ID	All as indicated in Table A-1 and A-2	7	3c	Radio-nuclides, metal / water

3.6 Quality Assurance and Quality Control

QA/QC considerations and requirements for field use of radiation monitoring instruments are presented in Table E-1.

Table E-1
Quality Control Samples and Data Quality Indicator Goals

QC or QC Sample	Number/Frequency	Data Quality Indicator Goals & Evaluation Criteria	Site specific Comments
FIELD RADIATION MONITORING SPECIFIED QA/QC			
Battery Check	At least once per day	Battery must have sufficient charge (see operating manual for minimum voltage requirements for some meters). Check should be documented.	Not Applicable
Background Check	At least one set of measurements per day should be collected from an area believed to be unaffected by source contamination. Background may have to be determined off-site.	Background rates should be documented. Documented detections should be at least 2 times background.	Not Applicable
Field Duplicates or Replicates	Occasionally recheck a monitored area to determine if any variance is noted.	< 35 RPD%	Not Applicable
Reference Source Check	Check in morning or before first use, mid-day, and end of day for each day of use. If instrument is used on consecutive days then subsequent morning checks can be eliminated.	< 35 RPD%	Not Applicable
FIELD SAMPLE RADIATION MONITORING SPECIFIED QA/QC			
Battery Check	At least once per day	Battery must have sufficient charge. Check should be documented	Not Applicable
Background	At least one set of reading per day should be collected from an area believed to be unaffected by source contamination. Background may have to be determined off-site	Background rates should be documented. Documented detections should be at least 2 times background.	Not Applicable
Blank	Check a sample of standard that is documented to be non-detect every 20 samples.	Blank sample rates should be documented. Documented detections should be at background.	Not Applicable
Field Duplicates or Replicates	Recheck at every 10 samples.	< 35 RPD%	Not Applicable
Reference Source	At least one set of source reading per day should be documented.	< 35 RPD%	Not Applicable

[1] SDG = Sample Delivery Group (Maximum 20 samples)
[2] RPD = Relative Percent Difference
[3] %R = Percent Recovery

General field sampling and analytical QA/QC considerations and requirements are presented in Table E-2.

Table E-2
Quality Control Samples and Data Quality Indicator Goals

QC Sample	Number/Frequency	Data Quality Indicator Goals & Evaluation Criteria	*MANDATORY* Site specific Comments
FIELD SPECIFIED QA/QC			
Background or reference location sample Air: up-wind. Surface soil: up-slope. Surface water: upstream. Ground water: up-gradient.	At least one sample should be collected from an area believed to be unaffected by source contamination.	A contaminated sample should be at least two times background.	Not required
Field Blanks Required for water.	1 per SDG[1], per matrix, per method	A contaminated sample should be at least two times the blank.	Field blanks will be prepared for each SDG shipped to each laboratory. Field blanks will be prepared from store-bought distilled water.
Equipment Blanks Required only when the use of decontaminated non-dedicated equipment is involved.	1 per SDG, per matrix, per method	Source samples should be at least two times the blank.	Not required
Field Duplicates or Replicates Required as needed by sampling objectives. The procedure for collecting the duplicate samples can greatly affect the reproducibility.	1 per SDG, per matrix, per method	Water - 25% RPD[2] Soil - 35% RPD[2] Other - 35% RPD[2a]	10% duplicates
Performance Standards	1 per project, per matrix, per method (if required by project)	75 -125 %R[3]	Not required
SELECTED LABORATORY QA/AC			
Method Blank	1 per SDG, per matrix, per method	Standards and samples should be at least 3 times the blank.	Mandatory.
Matrix Spike	1 per SDG, per matrix, per method on field designated sample.	75 -125 %R	Designate sample on COC.
Matrix Spike Duplicate or Replicate	1 per SDG, per matrix, per method on field designated sample.	≤20 RPD for metals	Designate sample on COC.
Second Source Reference Standards	1 per SDG, per matrix, per method	75 -125 %R	If available.
Internal Standards	All samples	50 -200 %R	All GC/MS and some GC analyses only.
Laboratory Control Standards	1 per SDG, per matrix, per method	75 - 125 %R	Per method for organic analyses.

[1] SDG = Sample Delivery Group (Maximum 20 samples)
[2] RPD = Relative Percent Difference
[3] %R = Percent Recovery

4.0 Project Organization and Responsibilities

4.1 Schedule of Sampling Activities

Sampling activities are summarized in Table F.

Table F
Proposed Schedule of Work For Sampling Activities

Activity	Start Date	End Date
Collection of drinking water samples	October 2010	October 2010
Data validation	November 2010	November 2010
Draft Report	December 2010	December 2010
Final Report	January 2010	January 2010

Resultant data will be validated by a chemist experienced in data validation.

4.2 Project Laboratories

Laboratories used for this project are summarized in Table G.

Table G
Laboratories

Lab Name/ Location	Methods
Isotech Laboratories, Inc Steve Pelphrey 1308 Parkland Court Champaign, IL 61821 Office: 217-398-3490 Email: steve@isotechlabs.com	2H/1H and 18O/16O analysis of water
GEL Laboratories, Charleston, SC Ship to: Jake Crook Project Manager GEL Laboratories, LLC 2040 Savage Road Charleston, SC (USA) 29407 Direct: 843.769.7390 Main: 843.556.8171 Fax: 843.766.1178 E-mail: jhc@gel.com	EPA Methods 900.0, 903.1, and 904.0 EPA Methods 9310 HASL 300 U-02 RC mod HASL 300 Th-01 RC mod EPA Method 300

4.3 Project Personnel and Responsibilities

Personnel and responsibilities are summarized in Table H.

Table H
Sample Team(s) Personnel

Personnel (Agency)	Responsibility
Harry Allen, EPA ERS	Task Monitor
Mike Folan, START	Project Manager
Howard Edwards, START	Quality Assurance Officer
Craig Tiballi, START	Field Monitoring and Sampling
NNEPA and/or DiNEH	Sampling Team (TBD)

4.4 Modification or Additions to the Generic Data Quality Objective for Emergency and Time Critical Sampling

Review the generic DQO to verify that the actual project objectives were similar to generic DQO. Project specific modification to the generic DQO statements for this are summarized in Table I. Also indicate which DQO step corresponds to the addition or modification.

Table I
DQO Modifications and Additions

Additions or Modifications to the Generic DQO Output Statements	DQO Step

Table J
Reporting Limits, Action Levels, and Quality Control Limits

Analysis	Analyte	Action Level (mg/L)	Quantitation Limit (µg/L)	Duplicate RPD	Matrix Spike	Matrix Spike RPD
Anions by 300.0	Fluoride	4	0.10	25	75-125	20
Anions by 300.0	Chloride	250	1.0	25	75-125	20
Anions by 300.0	Nitrite as N	1	0.10	25	75-125	20
Anions by 300.0	Nitrate as N	10	0.10	25	75-125	20
Anions by 300.0	o-Phosphate, as P	Not Available	1.0	25	75-125	20
Anions by 300.0	Sulfate	250 (s)	0.50	25	75-125	20
Metals by 6010B	Aluminum	0.1	100	25	75-125	20
Metals by 6010B	Antimony	0.1	100	25	75-125	20
Metals by 6010B	Arsenic	0.01	10	25	75-125	20
Metals by 6010B	Barium	2	20	25	75-125	20
Metals by 6010B	Beryllium	0.005	5	25	75-125	20
Metals by 6010B	Cadmium	0.01	10	25	75-125	20
Metals by 6010B	Calcium	Not Available	1000	25	75-125	20
Metals by 6010B	Chromium	0.10	10	25	75-125	20
Metals by 6010B	Cobalt	Not Available	20	25	75-125	20
Metals by 6010B	Copper	1.3 (s)	20	25	75-125	20
Metals by 6010B	Iron	Not Available	50	25	75-125	20
Metals by 6010B	Lead	0.015	5	25	75-125	20
Metals by 6010B	Magnesium	Not Available	600	25	75-125	20
Metals by 6010B	Manganese	0.05 (s)	15	25	75-125	20
Metals by 6010B	Mercury	0.002	0.5	25	75-125	20
Metals by 6010B	Nickel	Not Available	20	25	75-125	20
Metals by 6010B	Potassium	Not Available	5000	25	75-125	20
Metals by 6010B	Selenium	0.05	10	25	75-125	20
Metals by 6010B	Silver	0.10 (s)	10	25	75-125	20
Metals by 6010B	Thallium	0.002	10	25	75-125	20
Metals by 6010B	Vanadium	Not Available	20	25	75-125	20
Metals by 6010B	Zinc	5 (s)	10	25	75-125	20
Gross alpha by 900.0	alpha	See table A-1	1.0 piC/L	25	75-125	20
Gross beta by 900.0	beta	See table A-1	1.0 piC/L	25	75-125	20
903.1	Ra-226	See table A-1	1.0 piC/L	25	75-125	20
904.0	Ra-228	See table A-1	1.0 piC/L	25	75-125	20
Isotopic Th by HASL 300 Th-01-RCmod	Th-238, 230, 232	See table A-1	1.0 piC/L	25	75-125	20
Isotopic U by HASL 300 U-02-RC mod	U-233/234, U-235/236, U-238	See table A-1	1.0 piC/L	25	75-125	20

Key: RPD = relative percent difference; mg/L = milligrams per liter; µ/L = micrograms per Liter NA = Not Applicable

(s) = National Secondary Drinking Water Regulation not enforceable and not an action limit for this assessment